

ISSUE EMD-GS0859



Robin Generator **RGV Series**

PRO OHV GASOLINE ENGINE GENERATOR

SERVICE MANUAL

 **FUJI HEAVY INDUSTRIES LTD.**

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NOTE : As for the servicing information on engine portion, please refer to the EH17, EH25 and EH34 engine service manual.

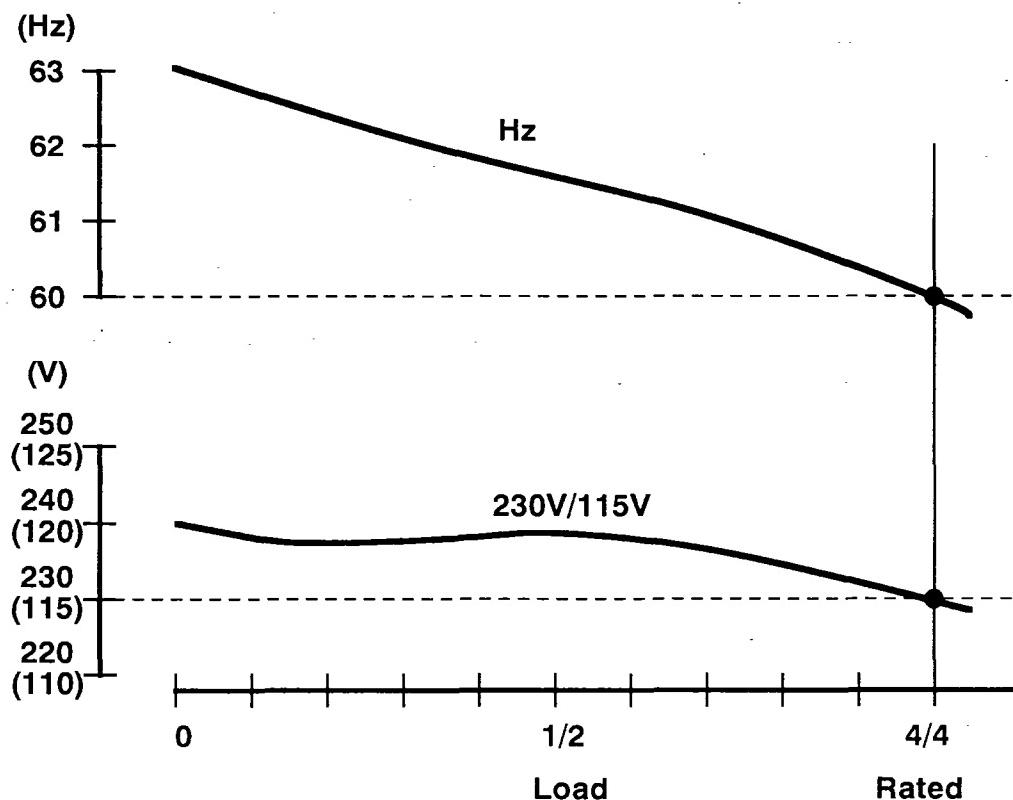
1. SPECIFICATIONS

Model		RGV2200				RGV2600							
ALTERNATOR	Type	Brushless, Self-Exciting, 2-Pole, Single Phase											
	Frequency	50Hz		60Hz		50Hz		60Hz					
	Maximum Output	1,650W		2,200W		2,300W		2,600W					
	Rated Output	1,400W		1,800W		2,000W		2,200W					
	AC	Voltage	110V	11.8A	110V	13.6A	110V	15.5A	110V	18.2A			
			220V	5.9A	120V	12.5A	220V	7.7A	120V	16.7A			
		Current	240V	5.4A	220V	6.8A	240V	7.1A	220V	9.1A			
			110V/220V	11.8A/5.9A	110V/220V	13.6A/6.8A	110V/220V	15.5A/7.7A	110V/220V	18.2A/9.1A			
		—	—	120V/240V	12.5A/6.3A	—	—	120V/240V	16.7A/8.3A				
	Power Factor	1.0											
	DC Output	12V-8.3A (100W)											
	Voltage Regulator	Condenser Type											
	Voltage Regulation	Within 10%											
ENGINE	Type	Air-Cooled 4-Cycle, Overhead Valve Gasoline Engine											
	Model	EH17D											
	Displacement	172 cc (10.50 cu. in.)											
	Rated Output	3.5 HP/3600 rpm											
	Fuel	Automobile Gasoline											
	Fuel Tank Capacity	12 liters (3.17 U.S. gal.)											
	Fuel Consumption Ratio (at Rated Output)	50Hz: 11.4 liters/hour 60Hz: 9.4 liters/hour				50Hz: 8.9 liters/hour 60Hz: 8.0 liters/hour							
	Oil Capacity	0.65 liters											
	Starting System	Recoil Starter											
Dimensions L × W × H		546 × 394 × 480 mm											
Dry Weight		45 kg (99 lbs.)				47 kg (104 lbs.)							

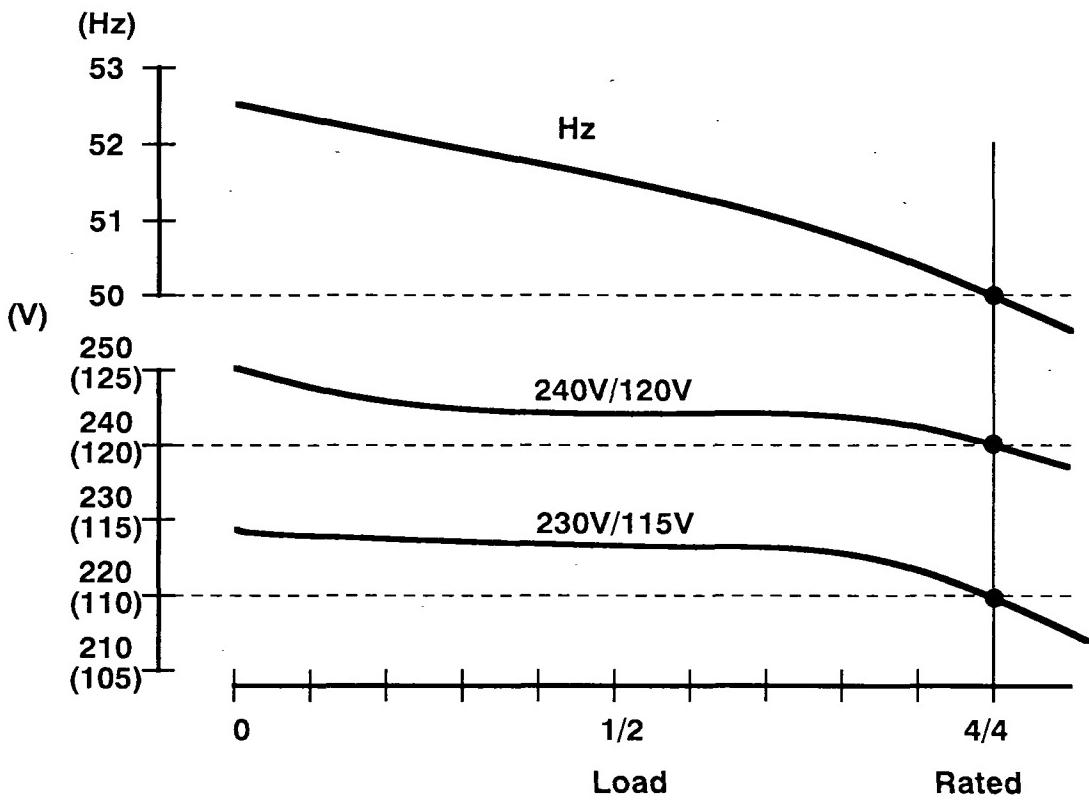
Model		RGV4000				RGV6000				
ALTERNATOR	Type	Brushless, Self-Exciting, 2-Pole, Single Phase								
	Frequency	50Hz		60Hz		50Hz		60Hz		
	Maximum Output	3,500W		4,000W		5,000W		5,700W		
	Rated Output	3,000W		3,500W		4,400W		4,800W		
	AC	Rated Voltage	110V	22.7A	110V	26.4A	110V	40A	110V	
			220V	11.4A	120V	24.2A	220V	20A	120V	
	Voltage	Current	240V	10.4A	220V	13.2A	240V	18.3A	220V	
			110V/220V	22.7A/11.4A	110V/220V	26.4A/13.2A	110V/220V	40A/20A	110V/220V	
	Power Factor								1.0	
	DC Output								12V-8.3A (100W)	
ENGINE	Voltage Regulator	Condenser Type								
	Voltage Regulation	Within 10%								
	Type	Air-Cooled 4-Cycle Overhead Valve Gasoline Engine								
	Model	EH25D				EH34D				
	Displacement	251 cc (15.32 cu. in.)				338 cc (20.63 cu. in.)				
	Rated Output	5.5 HP/3600 rpm				8.0 HP/3600 rpm				
	Fuel	Automobile Gasoline								
	Fuel Tank Capacity	16.6 liters (4.38 U.S. gal.)								
	Fuel Consumption Ratio (at Rated Output)	50Hz: 8.3 liters/hour 60Hz: 6.9 liters/hour				50Hz: 5.7 liters/hour 60Hz: 5.1 liters/hour				
	Oil Capacity	1.0 liters				1.2 liters				
Starting System		Recoil Starter and Optional Electric Starter								
Dimensions L × W × H		577 × 430 × 540 mm				660 × 470 × 585 mm				
Dry Weight		59 kg (130 lbs.)				76 kg (168 lbs.)				

2. PERFORMANCE CURVES

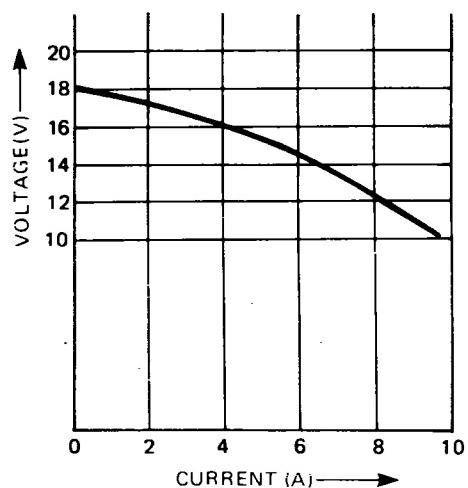
60Hz



50Hz



DC OUTPUT



DC Voltage 12V
DC Ampere 8.3A
DC output 100W

The voltage curve shown in the left indicates the characteristic of DC output when charging a battery. The voltage may be decreased by 20% when the resistance load is applied.

NOTE: It is possible to use both DC and AC outputs simultaneously up to the rated output in total.

3. FEATURES

3-1 BRUSHLESS ALTERNATOR

Newly developed brushless alternator eliminates troublesome brush maintenance.

3-2 CONDENSER TYPE VOLTAGE REGULATOR

A trouble free condenser type voltage regulator ensures a stable voltage under all working conditions.

3-3 OIL SENSOR

Oil sensor automatically shuts off the engine whenever the oil level falls down below the lower limit to protect the engine from seizure.

3-4 QUIET OPERATION

Robin RGV series generator delivers a quiet operation with :

- A large super silent muffler.
- A quiet 4-stroke Robin Rro OHV engine.
- A silent cyclone air cleaner.

3-5 NO RADIO NOISE

Noise suppressor spark plug and spark plug cap are equipped standard to prevent radio frequency interference.

3-6 LARGE FUEL TANK

The large fuel tank allows more than 5 to 11 hours of continuous operation which is sufficient for a half day or one day work without refueling.

3-7 RUGGED TUBULAR FRAME

Full cradle type rugged tubular frame protects the generator all around.

3-8 COMPACT AND LIGHT WEIGHT

Newly developed brushless alternator enabled the RGV generators to be very compact in size and light in weight.

3-9 MINIMAL MAINTENANCE

- A brushless alternator release the operator from periodical brush maintenance.
- A trouble free condenser type voltage regulator.
- A drip-proof alternator design.
- No-fuse circuit breakers.
- An electronic pointless ignition system.
- A dust-proof cyclone air cleaner.

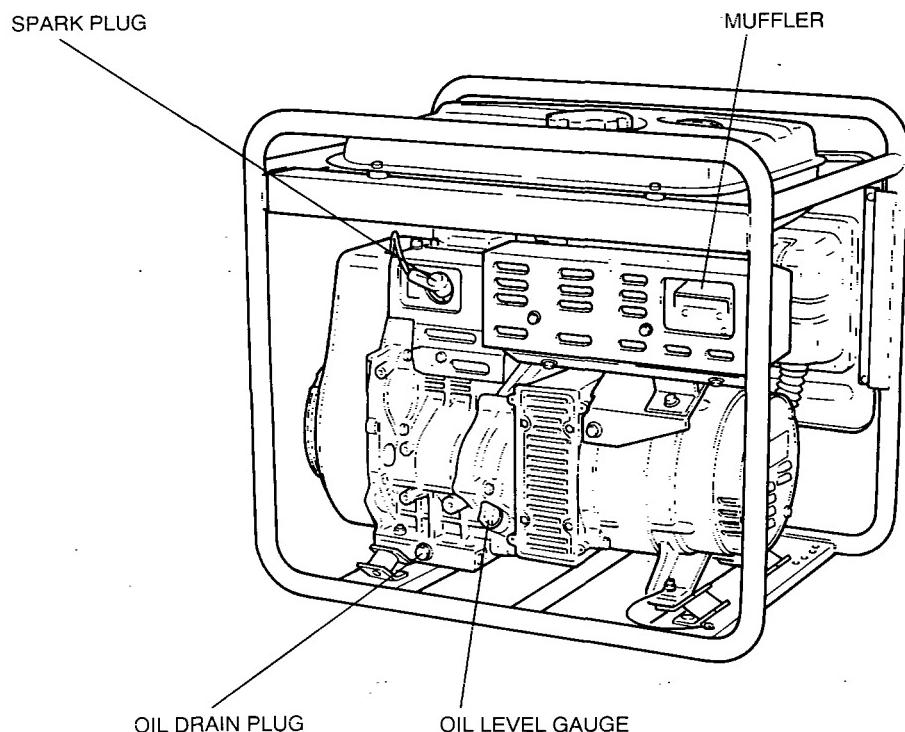
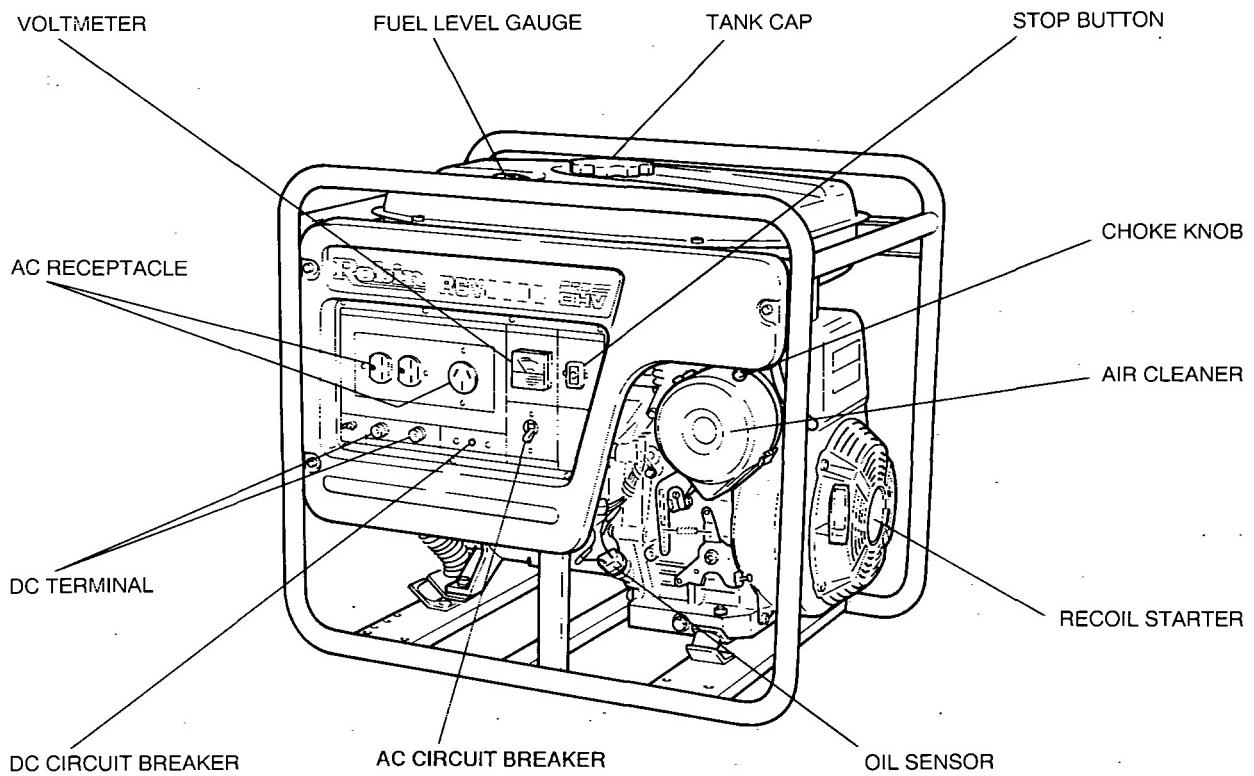
3-10 LONG-LIFE DURABILITY

The heavy-duty 4 stroke Robin Rro OHV engine and virtually maintenance-free brushless alternator ensure greater durability with :

- A brushless alternator with a condenser voltage regulator.
- Full rubber mount in a sturdy tubular frame.
- A forged steel crankshaft supported by two main ball bearings.
- A pointless electronic ignition system.
- A cast-iron cylinder liner.
- A forged aluminum connecting rod.

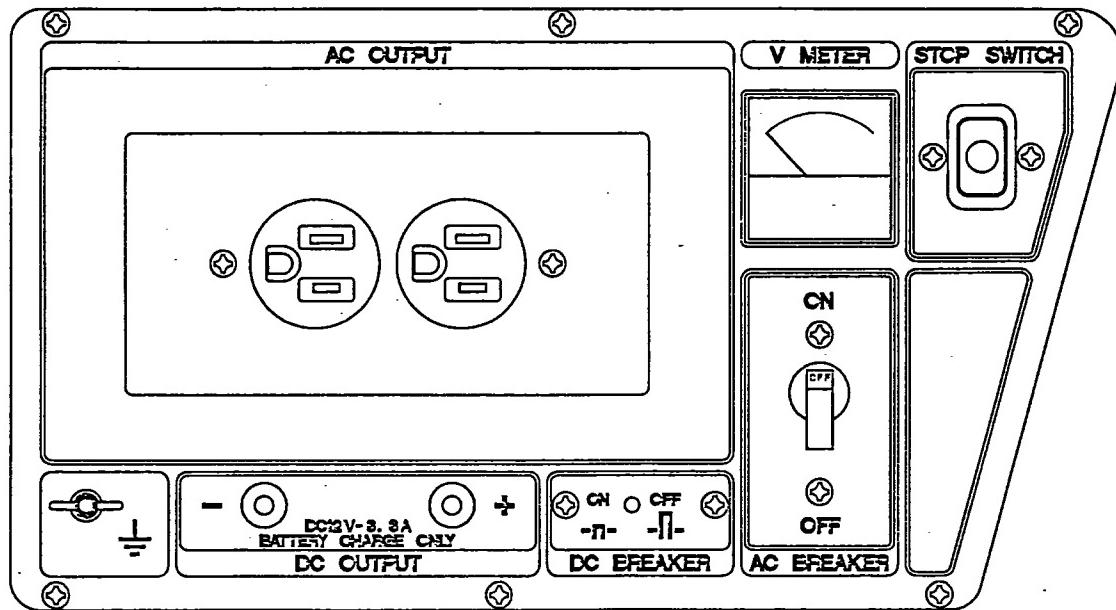
4. GENERAL DESCRIPTION OF THE GENERATOR

4-1 EXTERNAL VIEW of GENERATOR

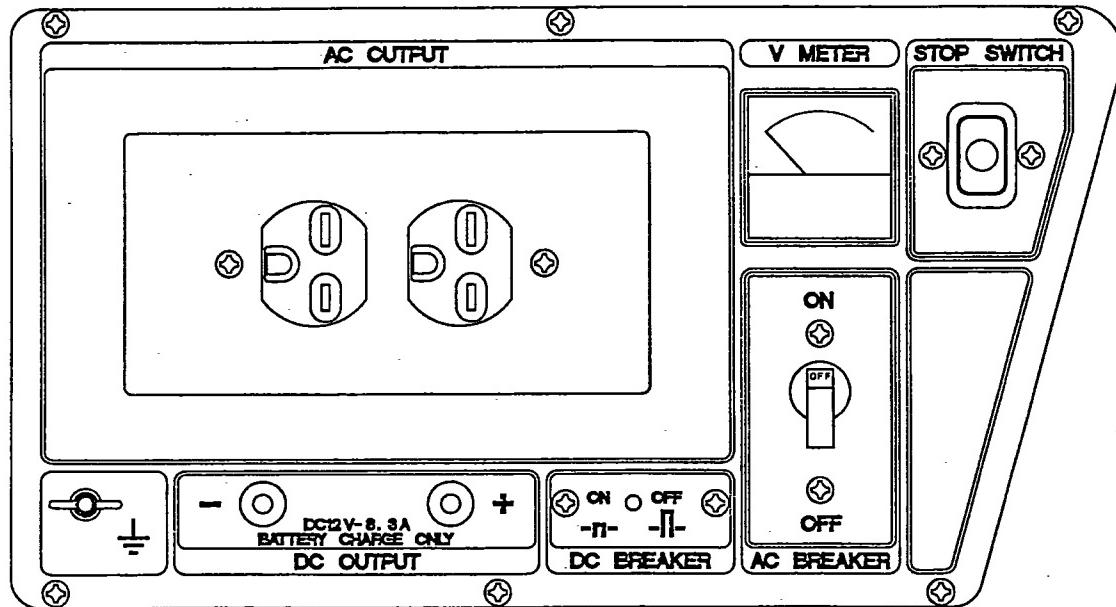


4-2 CONTROL PANEL

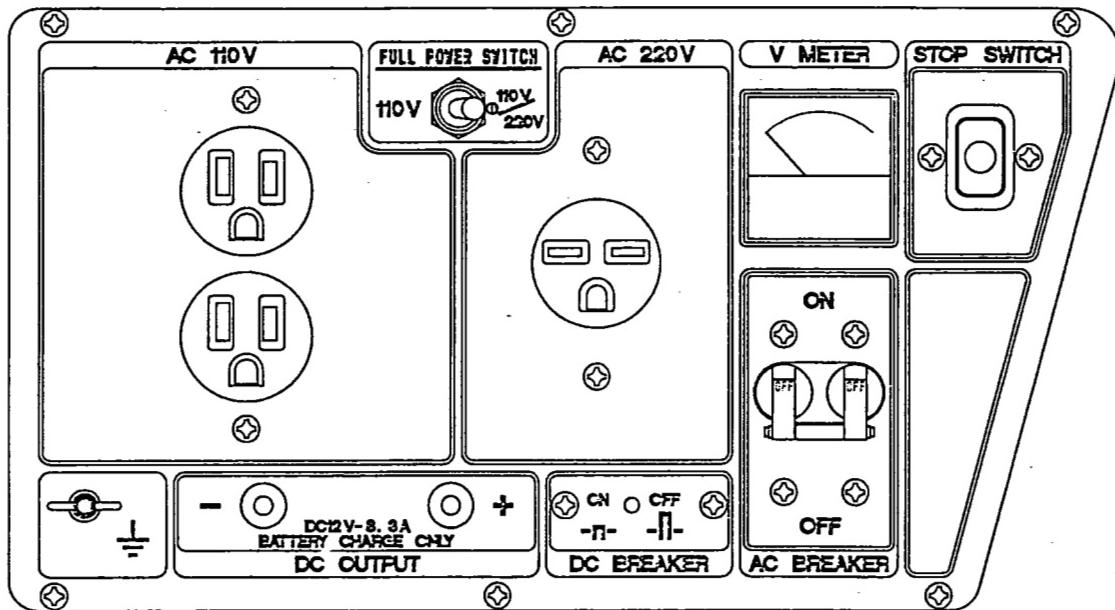
- RGV2200, RGV2600 : 50Hz, 60Hz-110V, 60Hz-120V TYPE



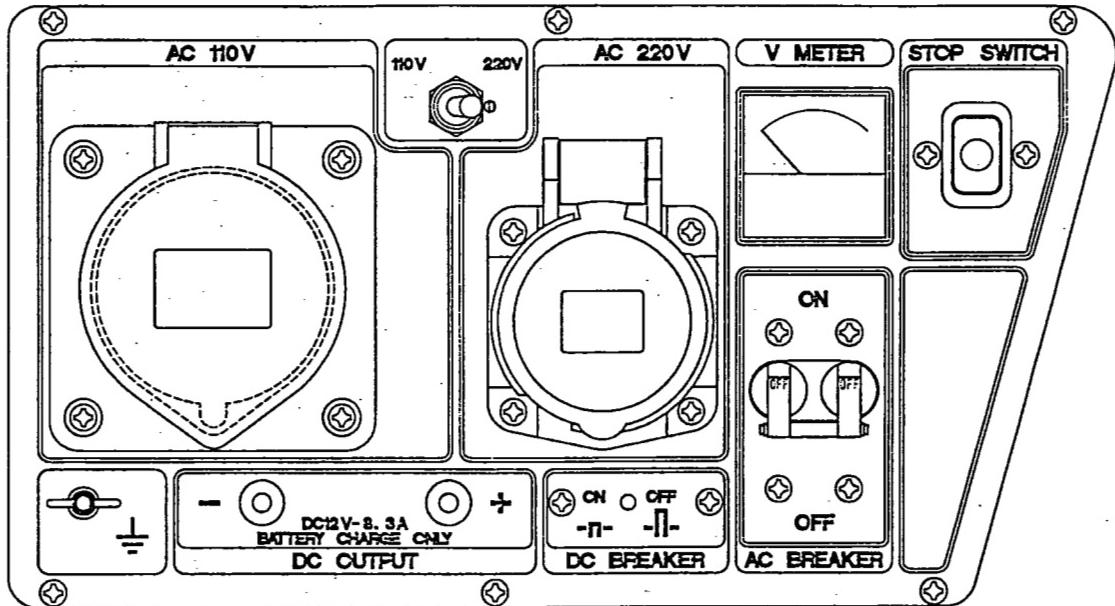
- RGV2200, RGV2600 : 50Hz-220V, 240V, 60Hz-220V TYPE



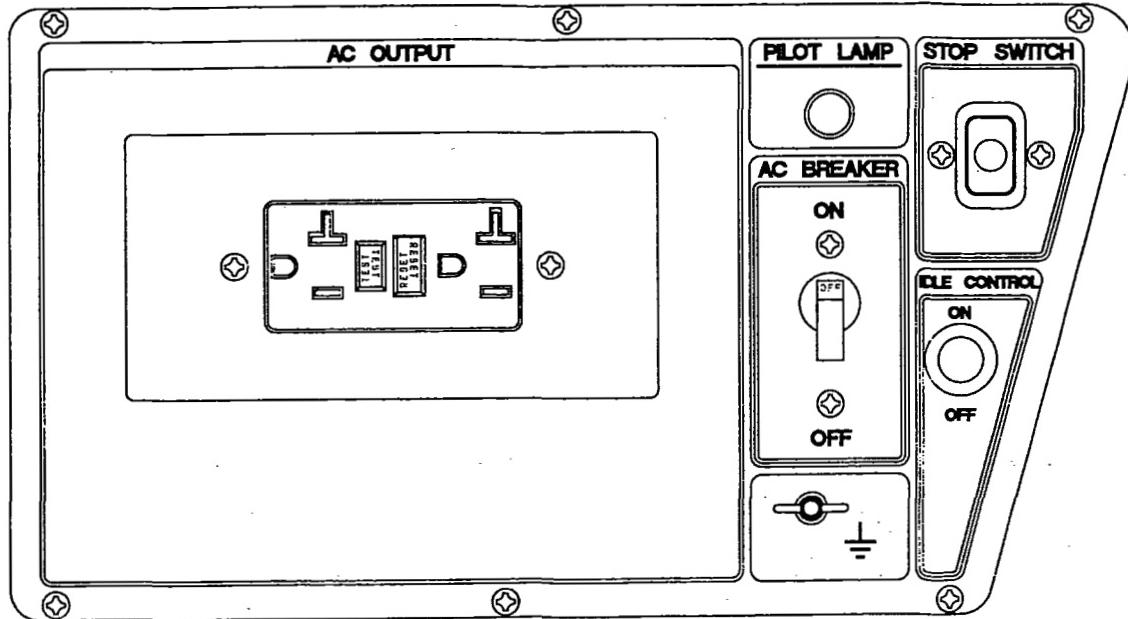
- RGV2200, RGV2600 : 50Hz, 60Hz-110V/220V DUAL VOLTAGE TYPE



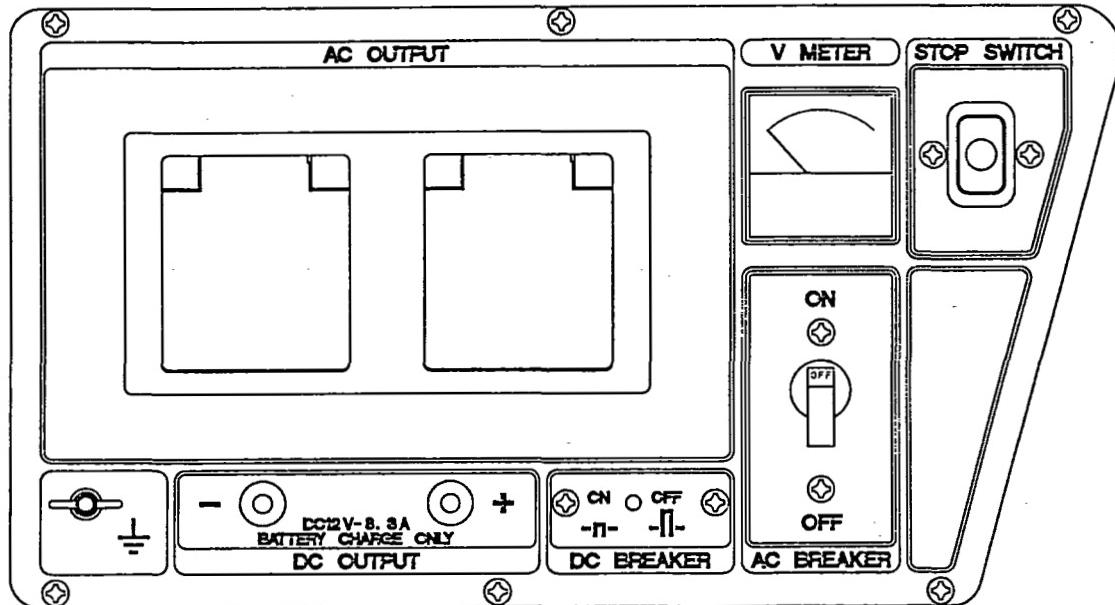
- RGV2200, RGV2600, RGV4000 : U.K., 50Hz-110V/120V [BS RECEPTACLE]



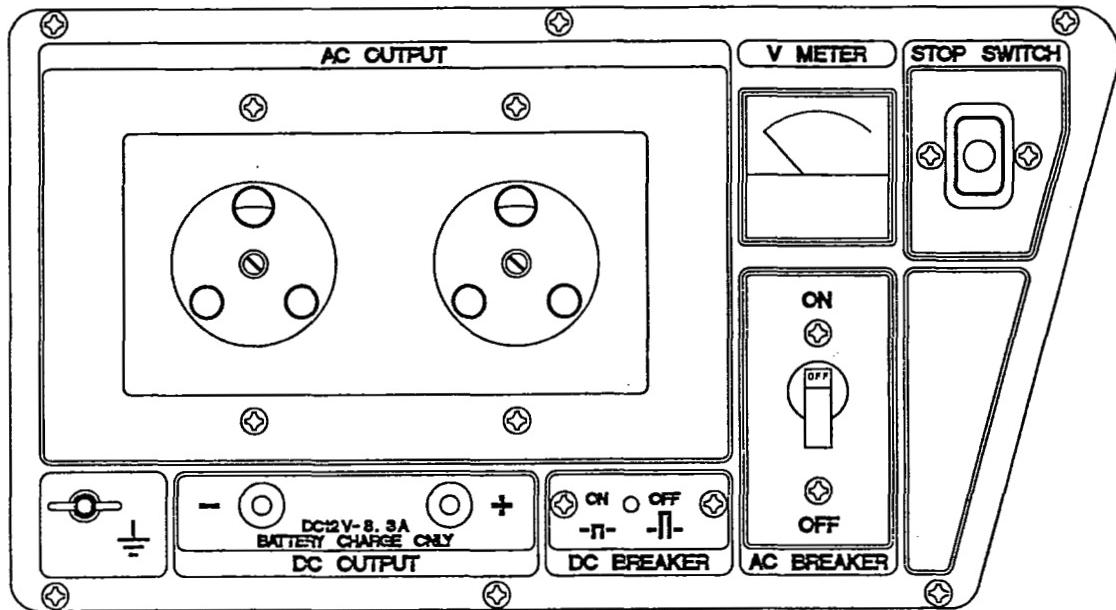
- RGV2600 : U.S.A., 60Hz-120V [NEMA RECEPTACLE]



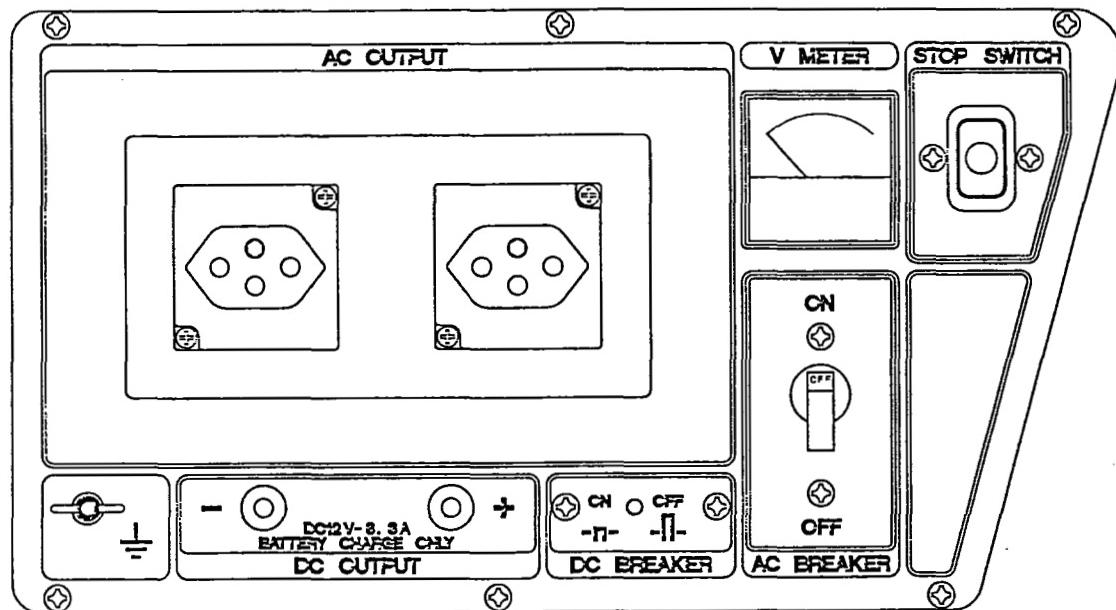
- RGV2200, RGV2600, RGV4000 : GERMANY, 50Hz-220V



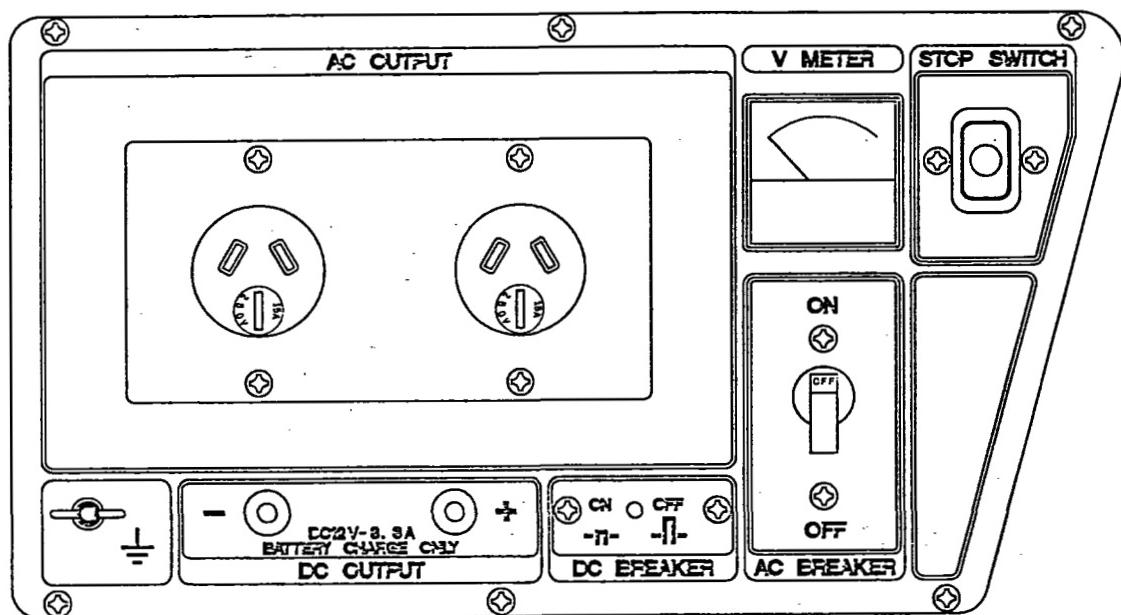
- RGV2200, RGV2600, RGV4000 : SOUTH AFRICA, 50Hz-220V



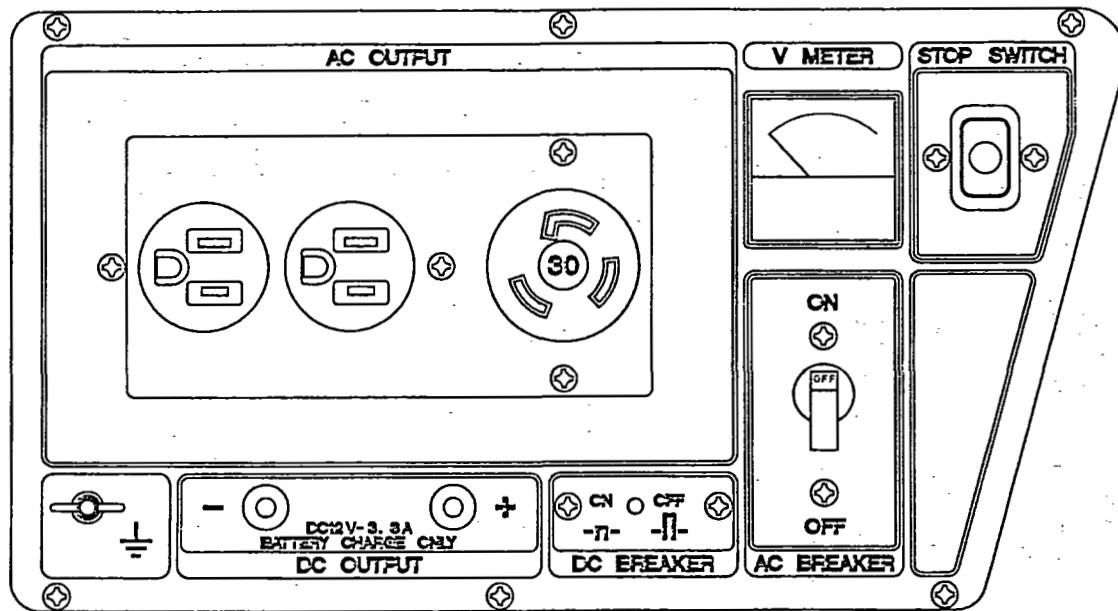
- RGV2200, RGV2600, RGV4000 : SWITZERLAND, 50Hz-220V



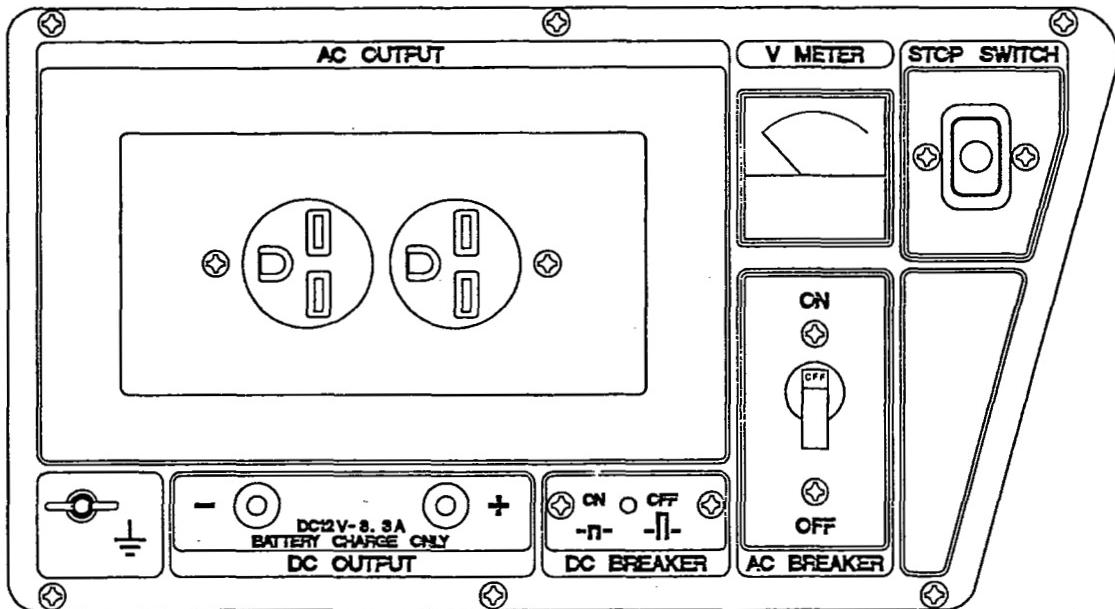
- RGV2200, RGV2600, RGV4000 : AUSTRALIA, 50Hz-240V



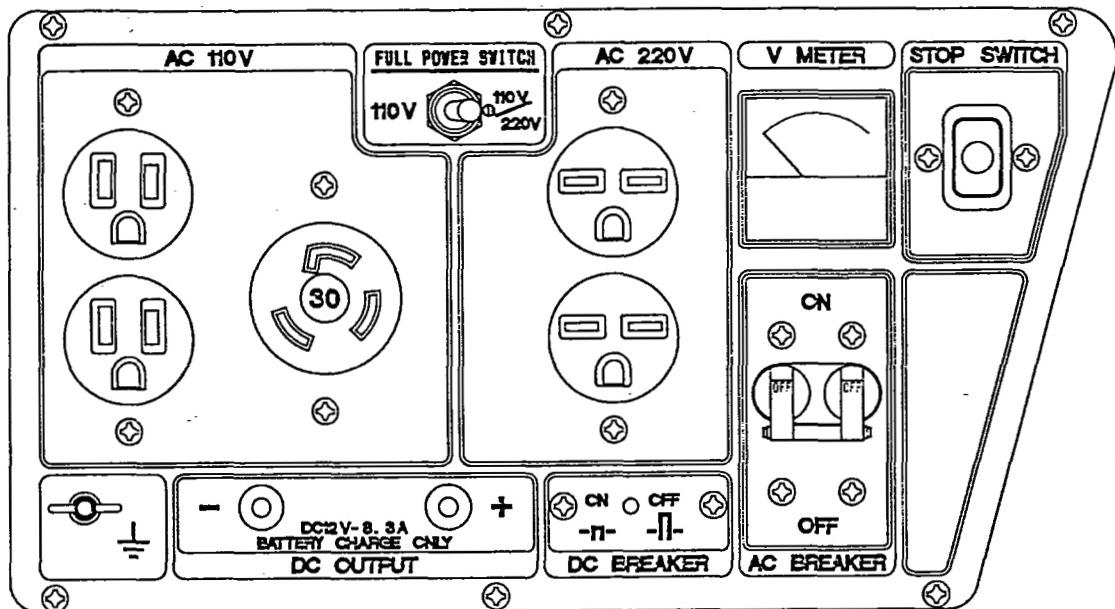
- RGV4000 : 50Hz, 60Hz-110V, 60Hz-120V TYPE



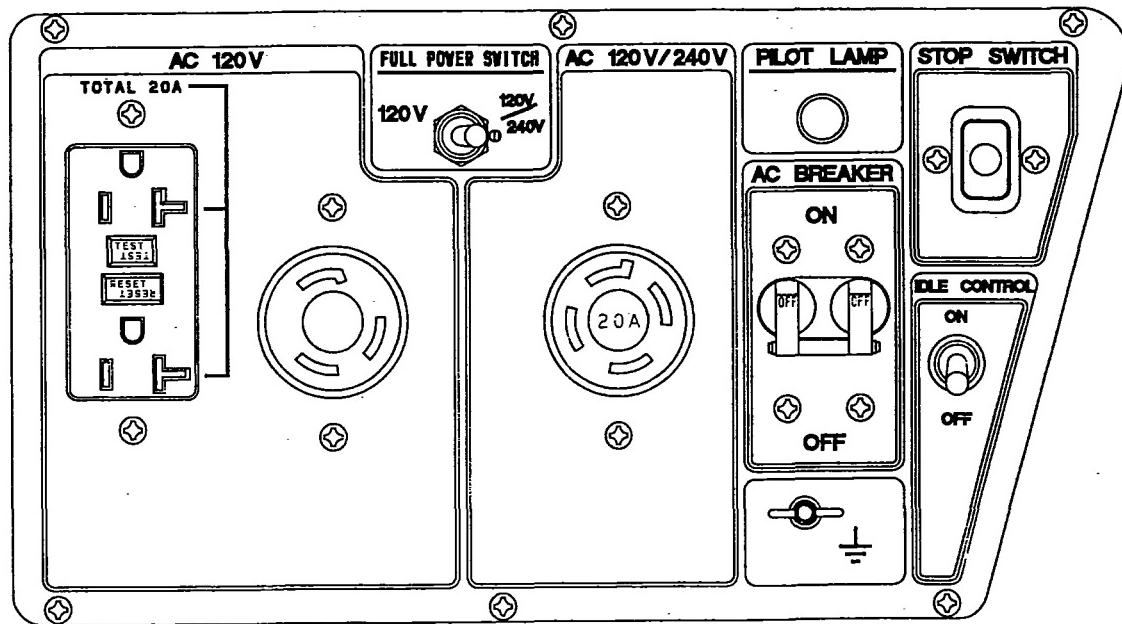
● RGV4000 : 50Hz-220V, 240V, 60Hz-220V TYPE



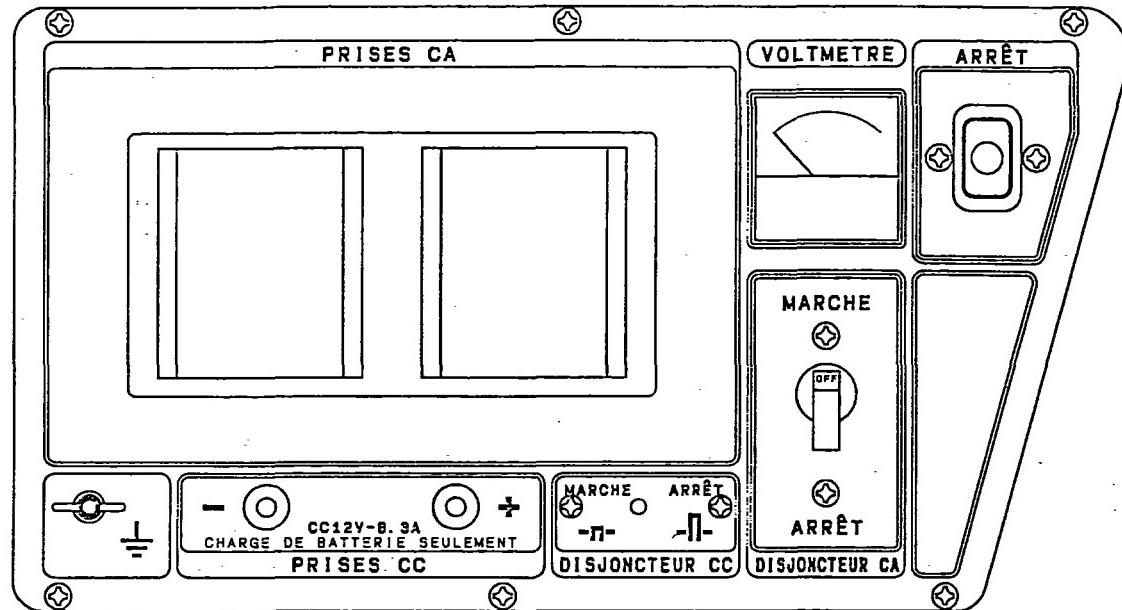
● RGV4000 : 50Hz, 60Hz-110V/220V TYPE



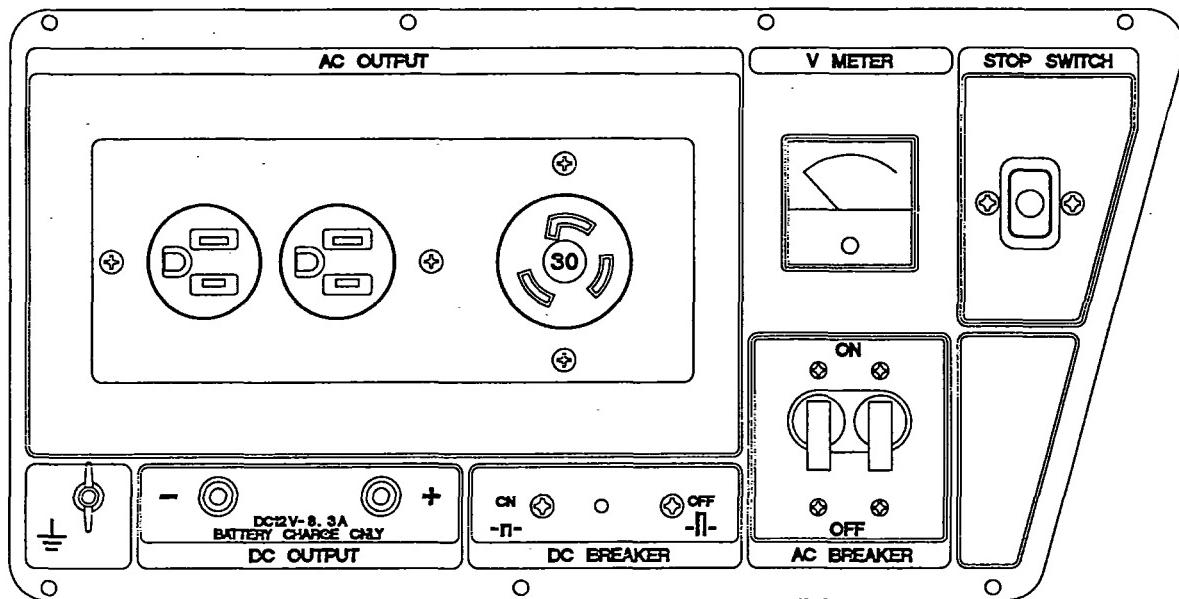
- RGV4000 : U.S.A., 60Hz-120V/240V [NEMA RECEPTACLE]



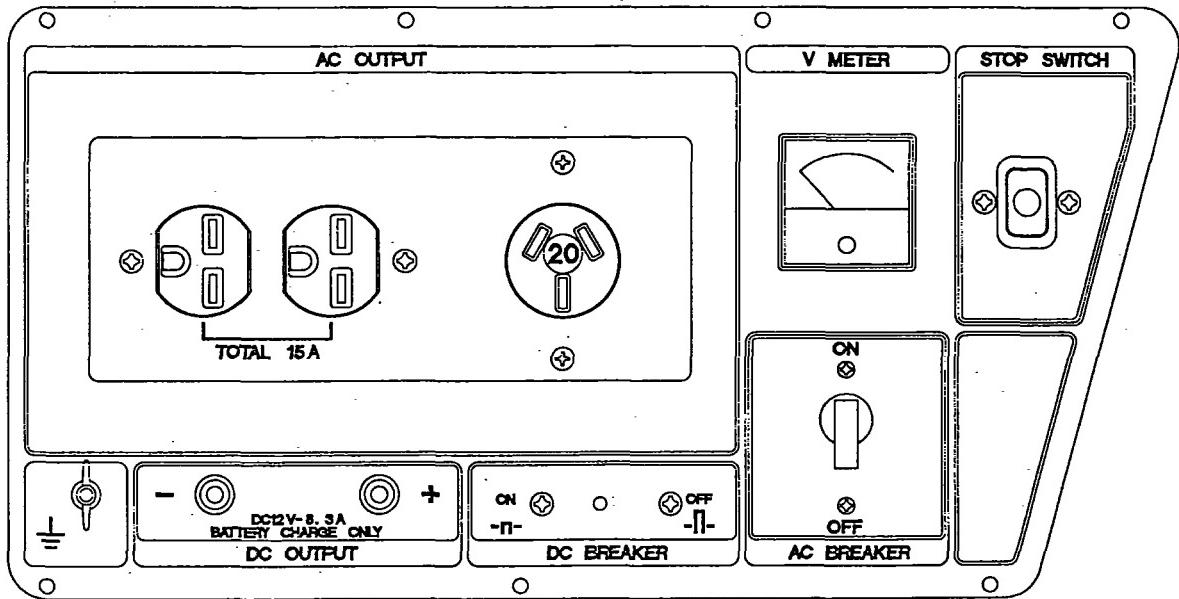
- RGV2200, RGV2600, RGV4000 : FRANCE, 50Hz-220V



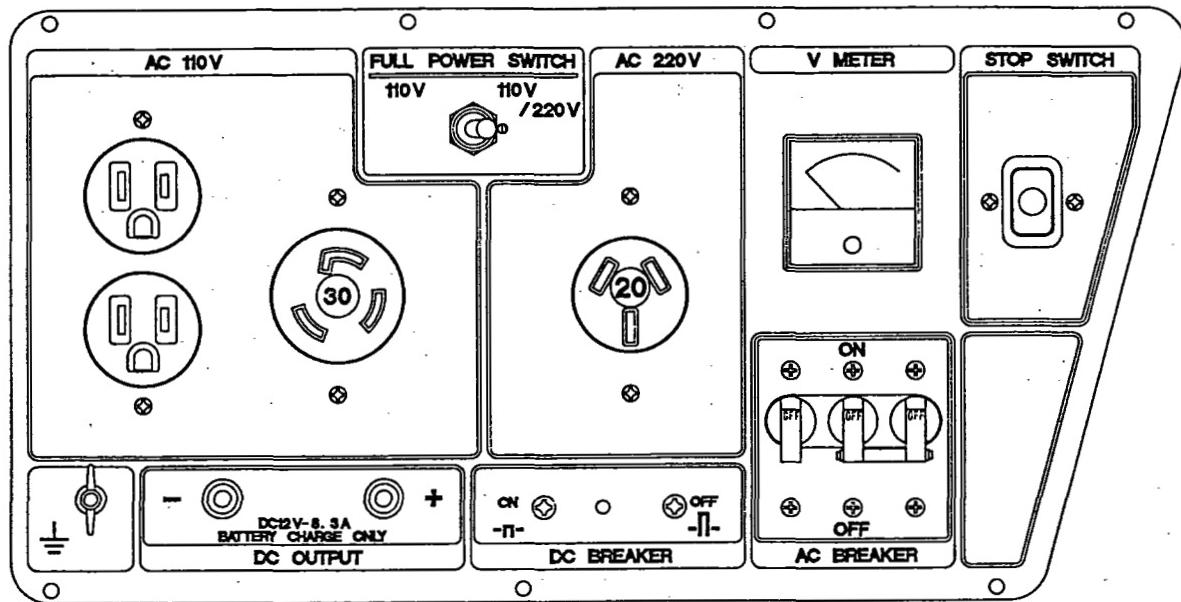
- RGV6000 : 50Hz, 60Hz-110V, 60Hz-120V TYPE



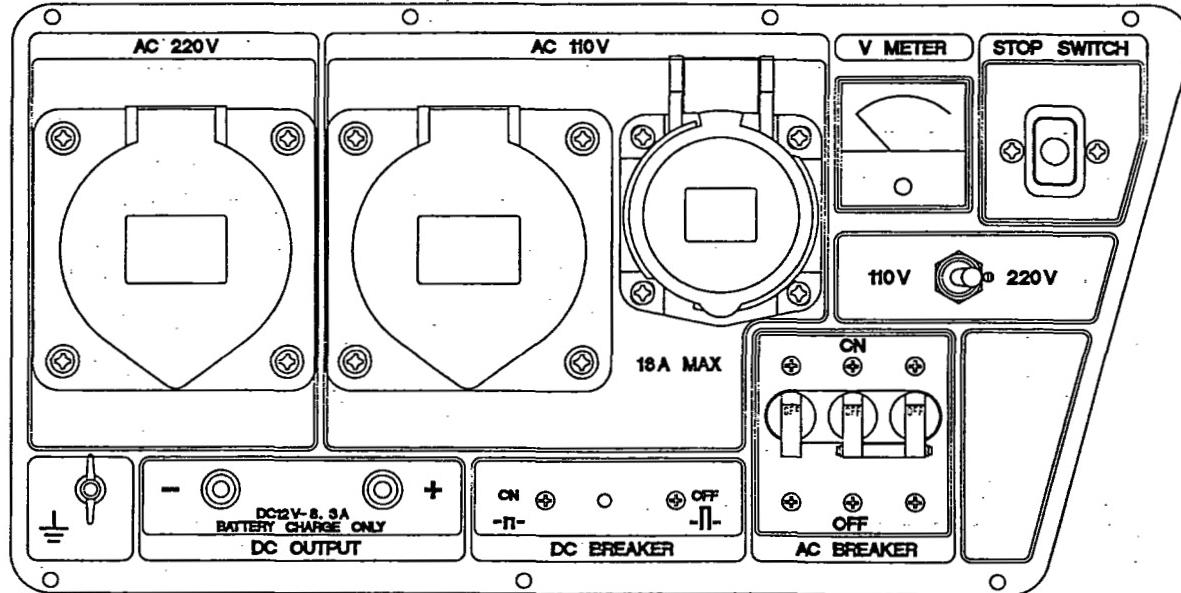
- RGV6000 : 50Hz-220V, 240V, 60Hz-220V TYPE



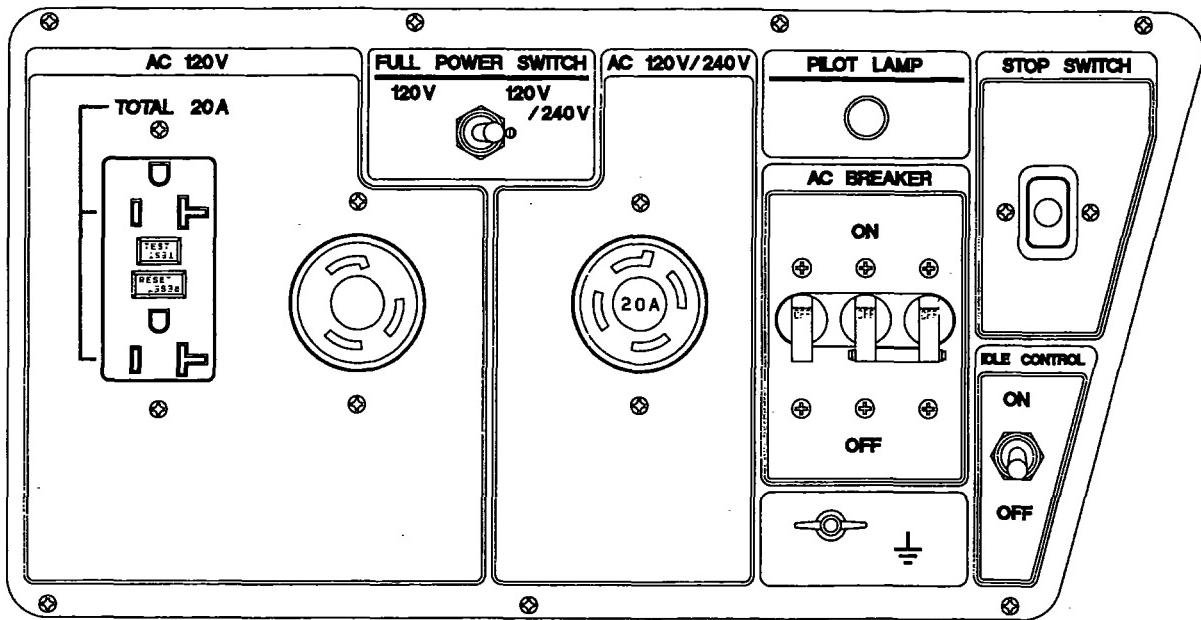
- RGV6000 : 50Hz, 60Hz-110V/220V DUAL VOLTAGE TYPE



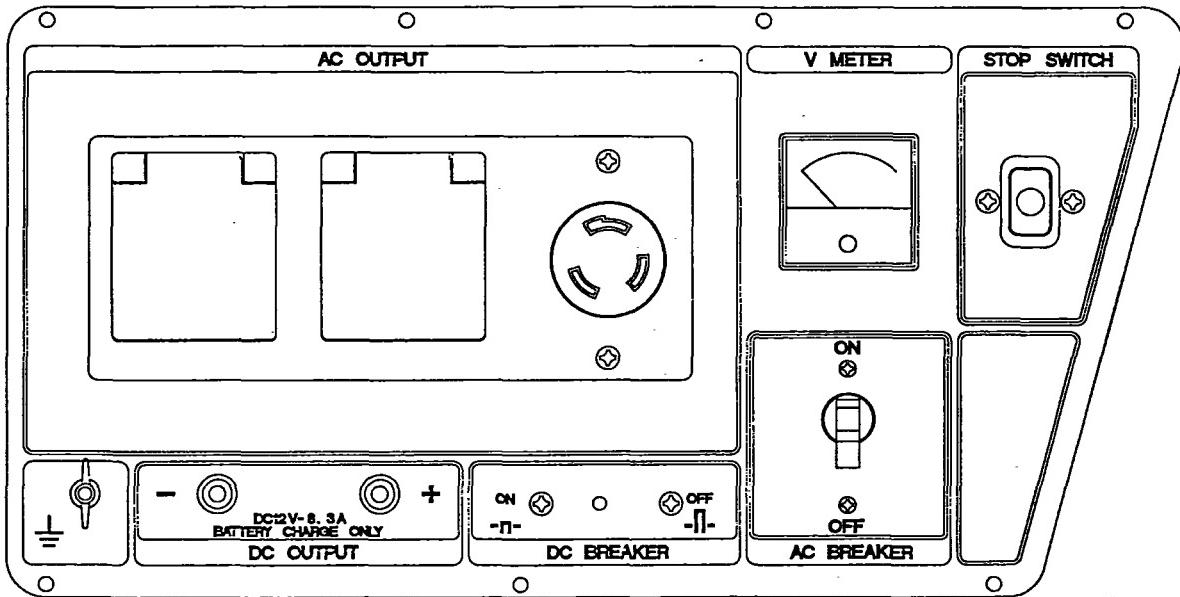
- RGV6000 : U.K., 50Hz-110V/220V [BS RECEPTACLE]



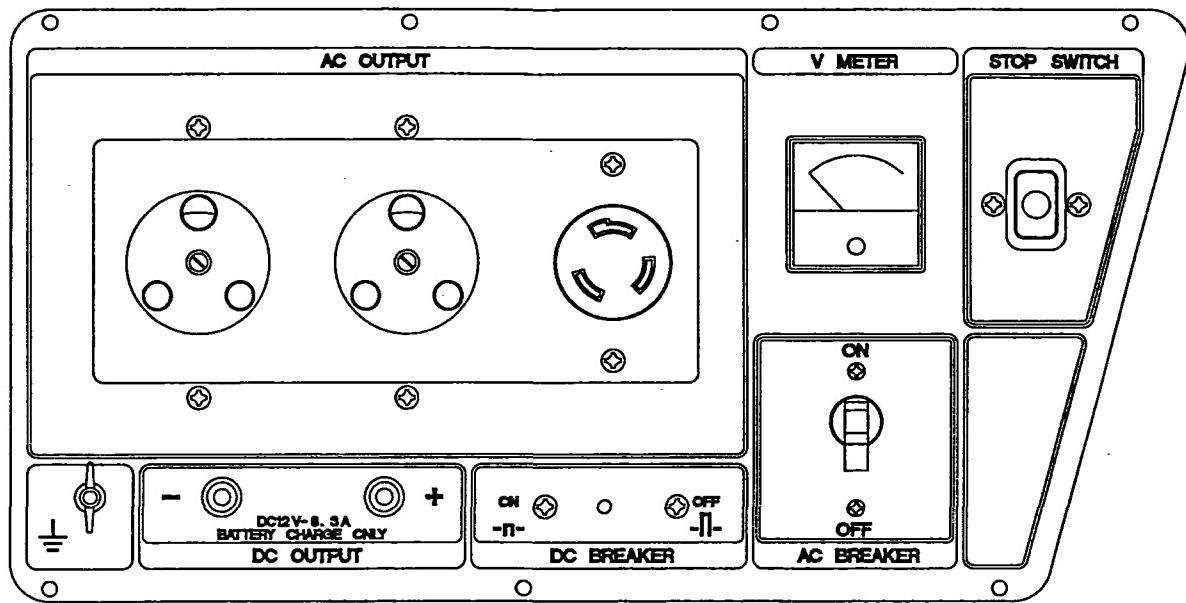
- RGV6000 : U.S.A., 60Hz-120V/240V [NEMA RECEPTACLE]



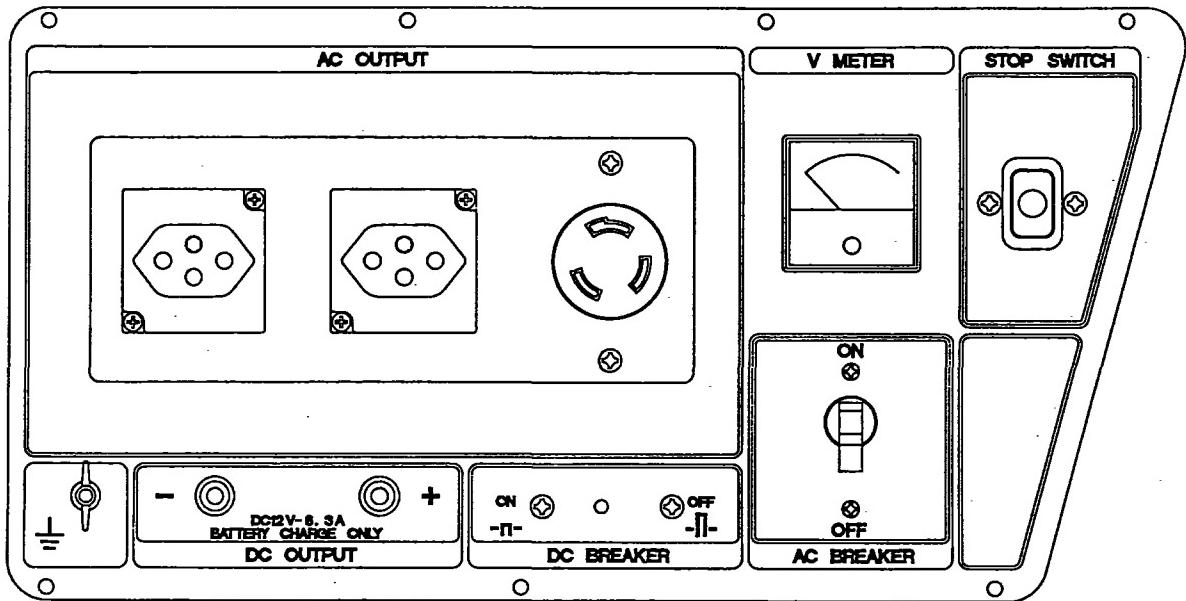
- RGV6000 : GERMANY, 50Hz-220V



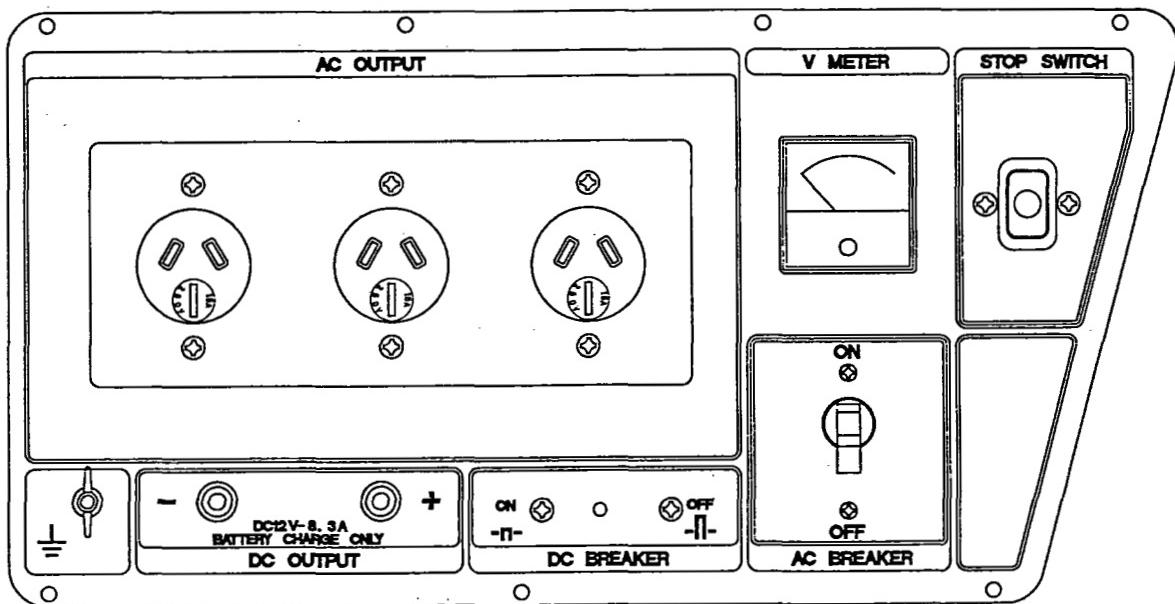
- RGV6000 : SOUTH AFRICA, 50Hz-220V



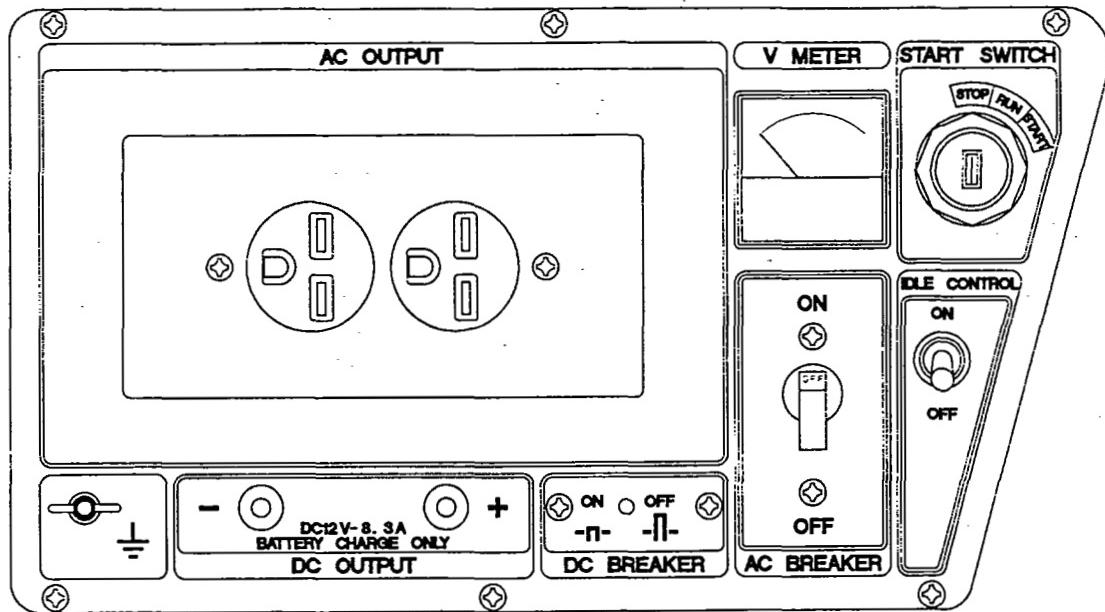
- RGV6000 : SWITZERLAND, 50Hz-220V



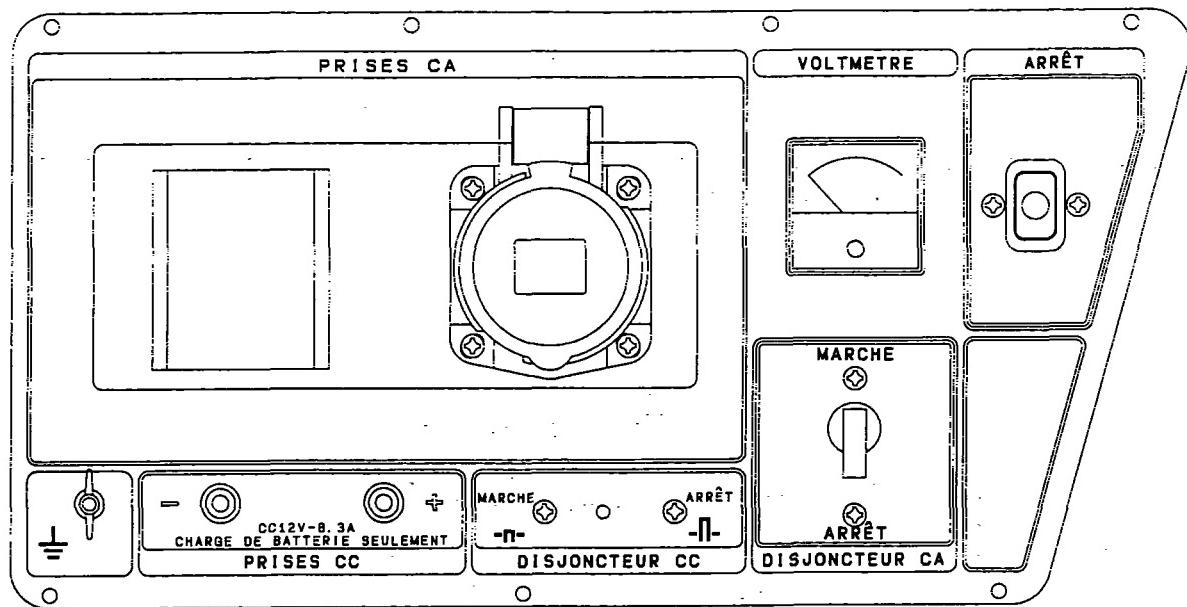
- RGV6000 : AUSTRALIA, 50Hz-240V



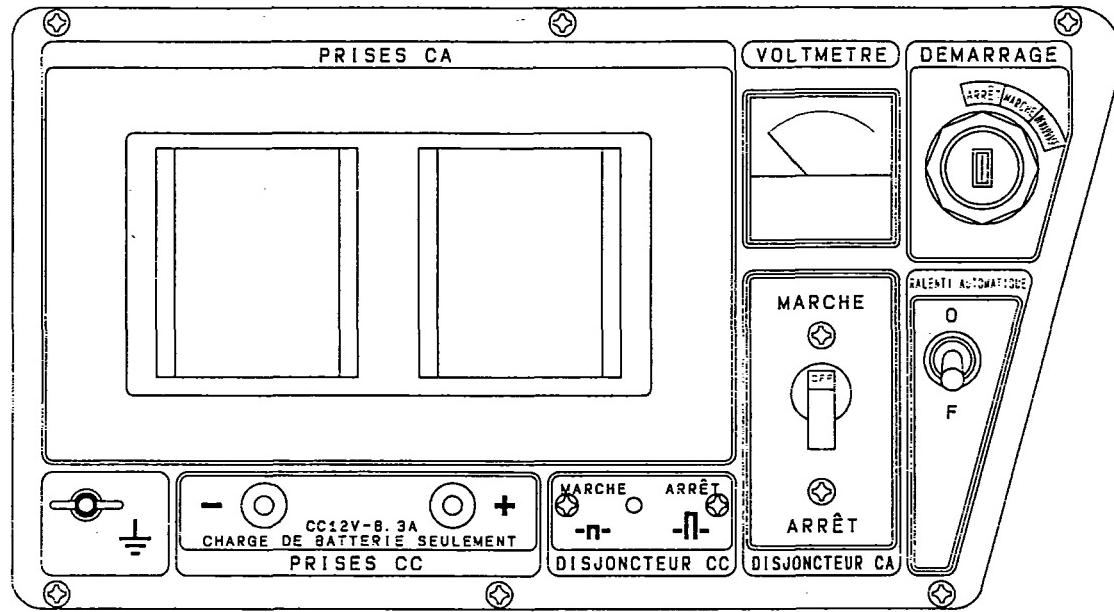
- RGV4000, RGV6000 : (With optional electric starter and idle control)



- RGV6000 : FRANCE, 50Hz-220V



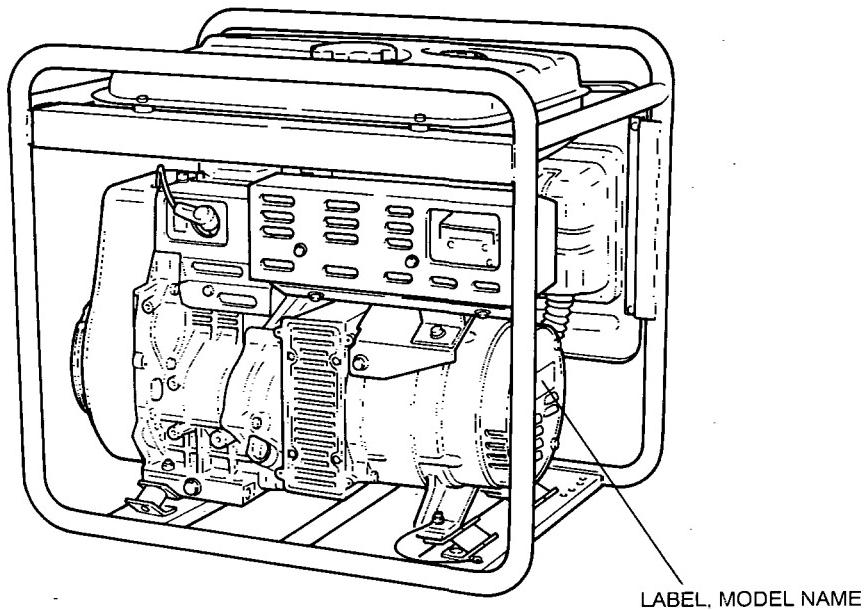
- RGV4000, RGV6000 : (With optional electric starter and idle control)



4-3 LOCATION of SERIAL NUMBER and SPECIFICATION NUMBER

Serial number and specification number are stamped on the LABEL (MODEL NAME) stuck on the end cover.

NOTE: Always specify these numbers when inquiring about the generator or ordering spare parts in order to get correct parts and accurate service.



5. CONSTRUCTION AND FUNCTION

5-1 CONSTRUCTION

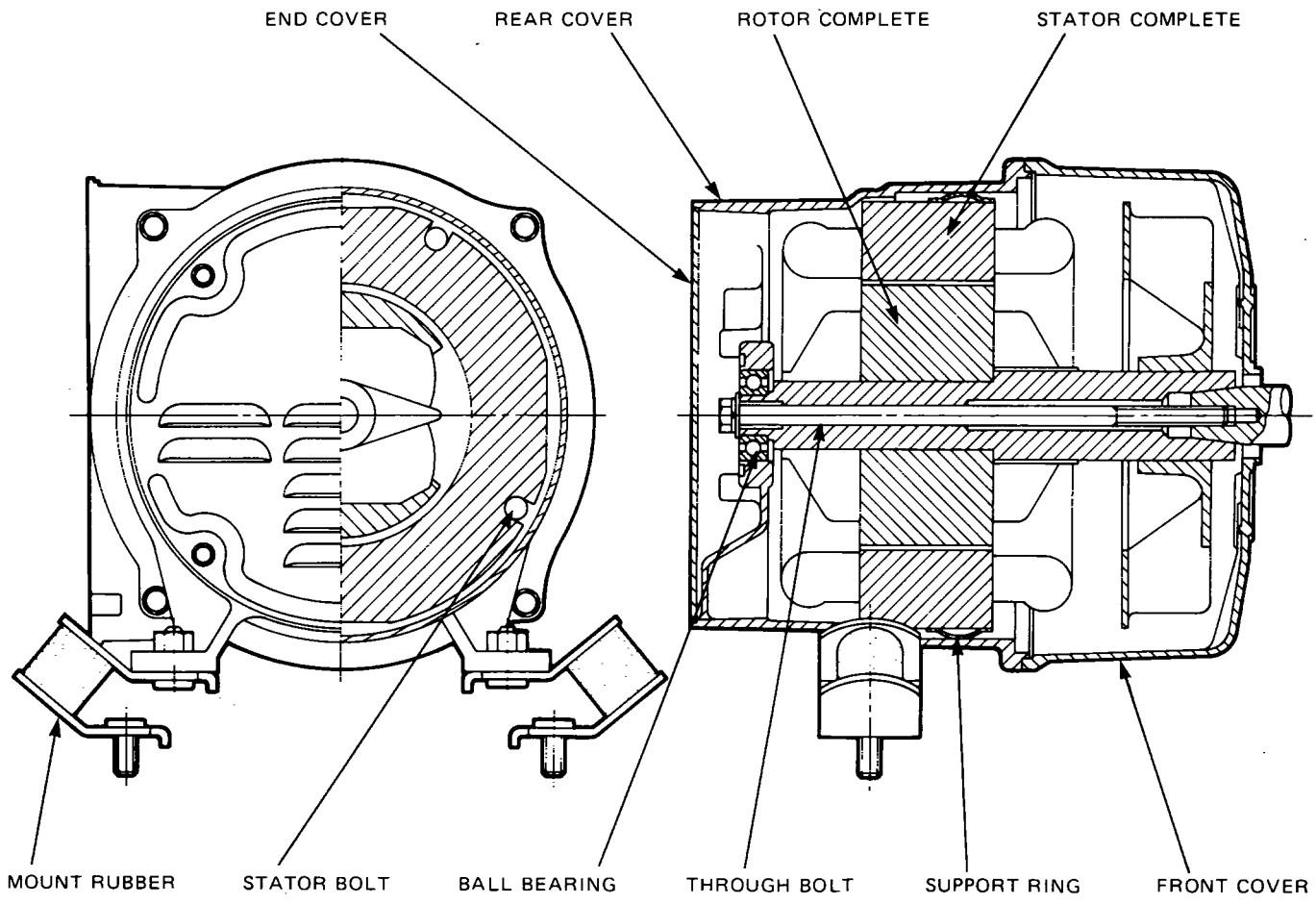


Fig. 5-1

5-2 FUNCTION

5-2-1 STATOR

The stator consists of a laminated silicon steel sheet core, a main coil and a condenser coil which are wound in the core slots.

The condenser coil excites the rotor field coil which generates AC voltage in the main coil.

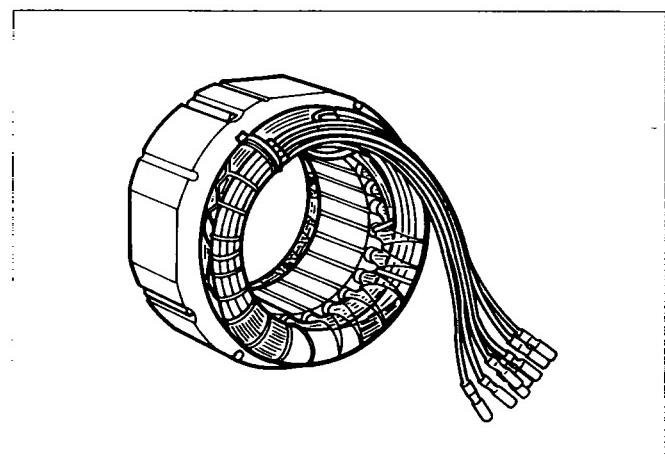


Fig. 5-2

5-2-2 CONDENSER

One or two condensers are installed in the control box and are connected to the condenser coil of the stator.

These condensers and condenser coil regulate the output voltage.

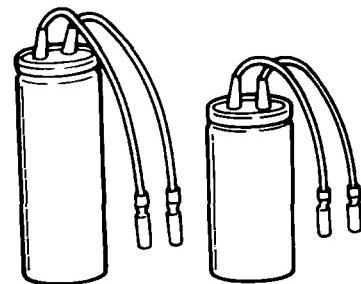


Fig. 5-3

5-2-3 ROTOR

The rotor consists of a laminated silicon steel sheet core and a field coil which is wound over the core.

DC current in the field coil magnetizes the steel sheet core. Two permanent magnets are provided for the primary exciting action.

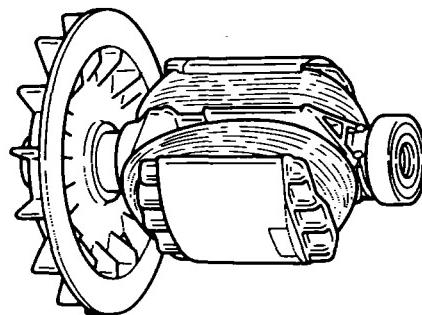


Fig. 5-4

A diode rectifier and surge absorber is mounted inside of the insulator.

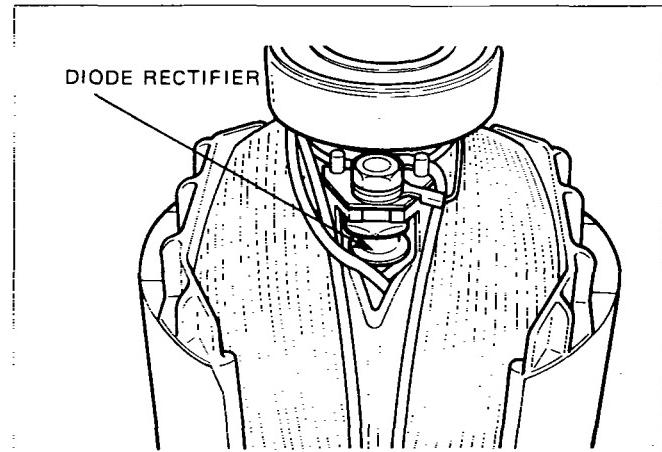


Fig. 5-5A

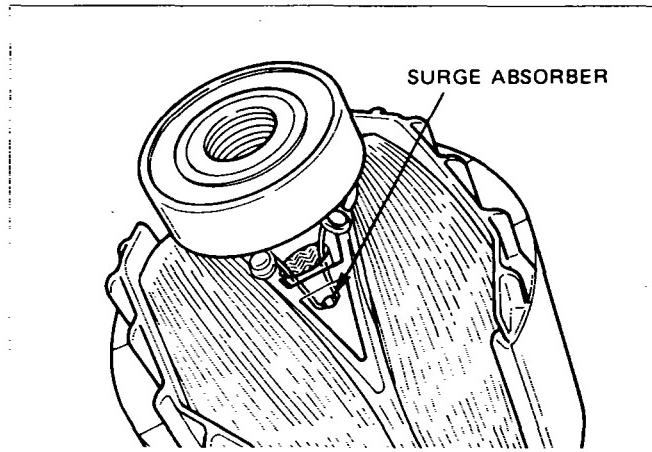


Fig. 5-5B

5-2-4 DC CIRCUIT BREAKER

- (1) The 10 ampere DC circuit breaker mounted on the control panel protects whole DC circuit from getting damage by overload or short circuit.

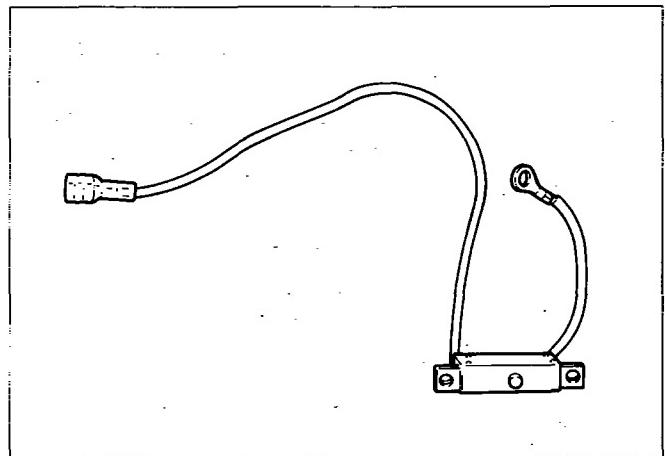


Fig. 5-6

5-2-5 NO-FUSE BREAKER

The no-fuse breaker protects the generator from getting damage by overloading or short circuit in the appliance. Table 5-1 shows the capacity of no-fuse breaker by each spec. and their object of protection.

MODEL	SPECIFICATION	NO-FUSE BREAKER	OBJECT of PROTECTION
RGV2200	50Hz-110V	12A	Total output amperage
	60Hz-110V, 120V	15A	Total output amperage
	50Hz-220V, 240V	6.5A	Total output amperage
	60Hz-220V	8A	Total output amperage
	50Hz-110V/220V	6.5A (2-Pole, 2-Element)	Total output amperage
	60Hz-120V/240V	8A (2-Pole, 2-Element)	Total output amperage
RGV2600	50Hz-110V	18A	Total output amperage
	60Hz-110V, 120V	20A	Total output amperage
	50Hz-220V	9A	Total output amperage
	60Hz-220V	10A	Total output amperage
	60Hz-240V	8A	Total output amperage
	50Hz-110V/220V	9A (2-Pole, 2-Element)	Total output amperage
	60Hz-110V/220V, 120V/240V	10A (2-Pole, 2-Element)	Total output amperage
RGV4000	50Hz-110V	27A	Total output amperage
	60Hz-110V, 120V	30A	Total output amperage
	50Hz-220V	14A	Total output amperage
	60Hz-220V	15A	Total output amperage
	50Hz-240V	12A	Total output amperage
	50Hz-110V/220V	14A (2-Pole, 2-Element)	Total output amperage
	60Hz-110V/220V, 120V/240V	15A (2-Pole, 2-Element)	Total output amperage
RGV6000	50Hz-110V	40A	Total output amperage
	60Hz-110V, 120V	30A	Output from 30A receptacle
	50Hz-220V, 60Hz-220V	20A	Total output amperage
	50Hz-240V	18A	Total output amperage
	50Hz-110V/220V, 60Hz-110V/220V, 60Hz-120V/240V	20A (2-Pole, 2-Element)	Total output amperage
		30A	Output from 30A receptacle

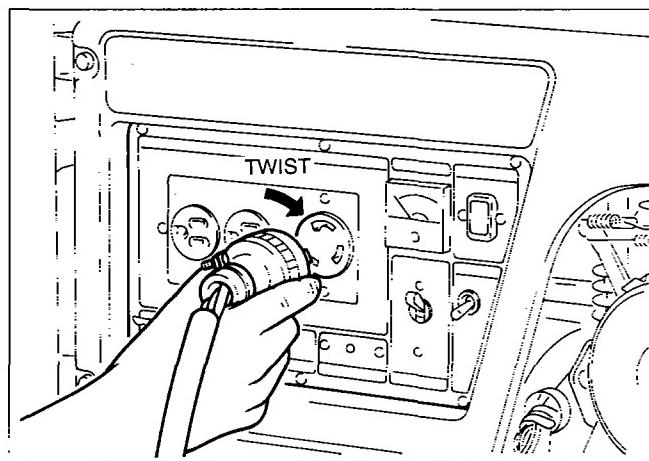
Table 5-1

5-2-6 RECEPTACLE and AC PLUG (STD.SPEC.)

These are used for taking AC output power from the generator. A total of five kinds of receptacles, each varying in rated voltage and current from another, are used. Each model has at least one receptacle to deliver the rated generator output. As many AC plugs as the receptacles, each matching the corresponding receptacle, are provided. Table 5-2 shows the rated current for each receptacle. Be careful not to use the receptacles and AC plugs beyond the specified amperage limits to prevent burning.

	up to total 15 amperes from two receptacles
	up to 15 amperes
	up to 20 amperes
	up to 30 amperes (See Caution.)

Table 5-2



Caution: To connect the appliance to locking receptacle, insert the plug into the receptacle and turn it clockwise to lock.

Fig. 5-7

NOTE: If your generator has receptacles peculiar to your country, Table 5-2 does not apply.

NOTE: The generator for U.S.A. market is equipped with NEMA standard receptacles shown in table 5-3. Use the proper plug for connecting appliance to the generator.

Style	Ampere	Receptacle	AC plug	Description
	125V 20A	NEMA 5-20R	NEMA 5-20P	GFCI (Ground Fault Circuit Interrupter) Receptacle, duplex
	125V/250V 20A	NEMA L14-20R	NEMA L14-20P	Locking Receptacle
	125V 30A	NEMA L5-30	NEMA L5-30P	Locking Receptacle

Table 5-3

5-3 DESCRIPTION of GENERATOR OPERATION

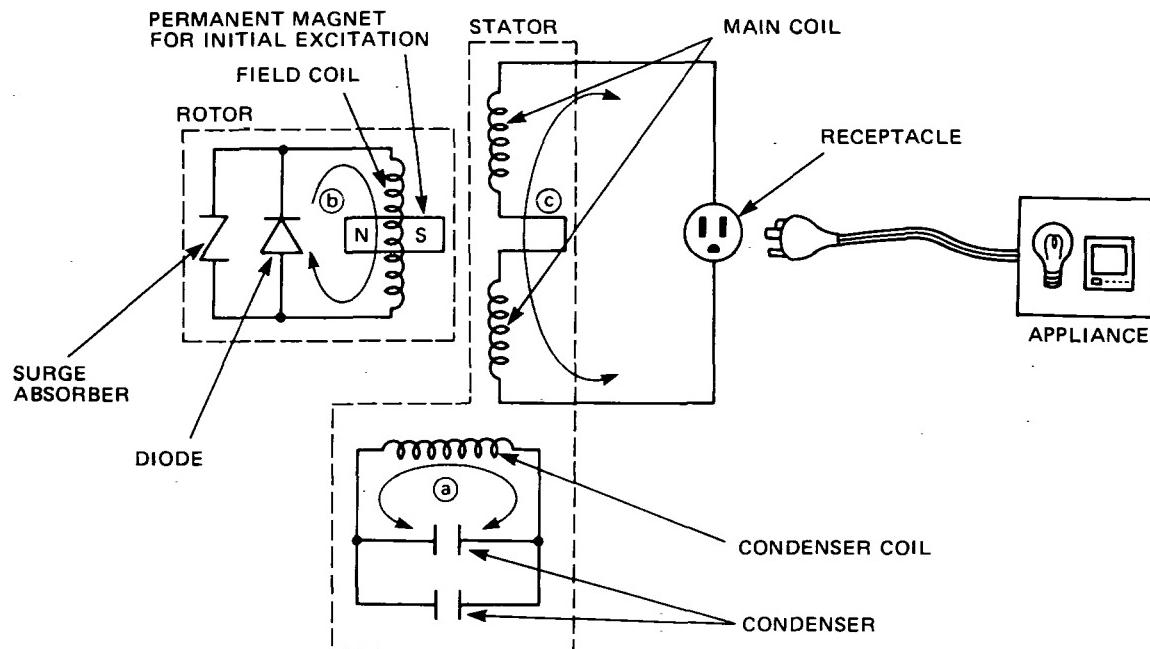


Fig. 5-8

5-3-1 GENERATION of NO-LOAD VOLTAGE

- (1) When the generator starts running, the permanent magnet built-in to the rotor generates 3 to 6V of AC voltage in the main coil and condenser coil wound on the stator.
- (2) As one or two condensers are connected to the condenser coil, the small voltage at the condenser coil generates a minute current ① which flows through the condenser coil. At this time, a small flux is produced with which the magnetic force at the rotor's magnetic pole is intensified. When this magnetic force is intensified, the respective voltages in the main coil and condenser coil rise up. As the current ① increases, the magnetic flux at the rotor's magnetic pole increases further. Thus the voltages at the main coil and condenser coil keep rising by repeating this process.
- (3) As AC current flows through the condenser coil, the density of magnetic flux in the rotor changes. This change of magnetic flux induces AC voltage in the field coil, and the diode rectifier in the field coil circuit rectifies this AC voltage into DC. Thus a DC current ② flows through the field coil and magnetizes the rotor core to generate an output voltage in the main coil.
- (4) When generator speed reaches 2700 to 2800 rpm (50Hz type) or 3000 to 3300 rpm (60Hz type), the current in the condenser coil and field coil increases rapidly. This acts to stabilize the output voltage of each coils. If generator speed further increases to the rated value, the generator output voltage will reach to the rated value.

5-3-2 VOLTAGE FLUCTUATIONS UNDER LOAD

When the output current ③ flows through the main coil to the appliance, a magnetic flux is produced and serves to increase current ④ in the condenser coil. When current ④ increases, the density of magnetic flux across the rotor core rises. As a result, the current flowing in the field coil increases and the generator output voltage is prevented from decreasing.

5-3-3 FULL POWER SWITCH (Dual Voltage Type)

The full power switch is provided for the dual voltage type to take out the full rated power from one receptacle in each voltage.

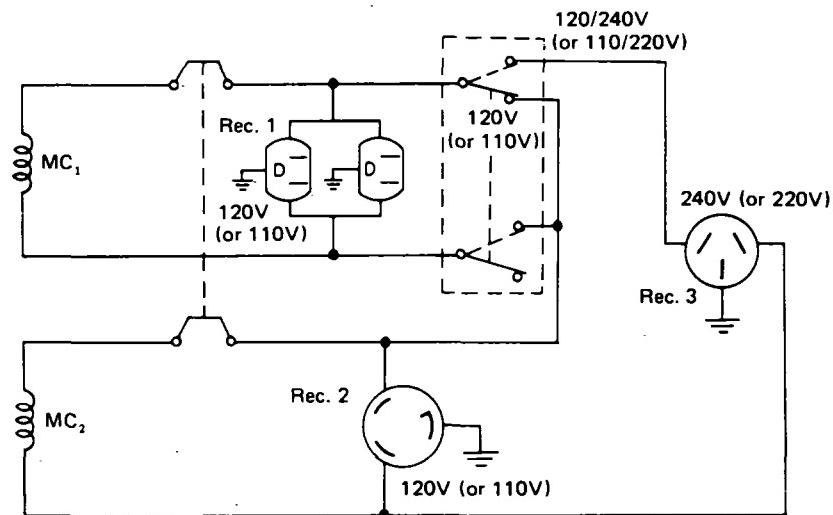


Fig. 5-9

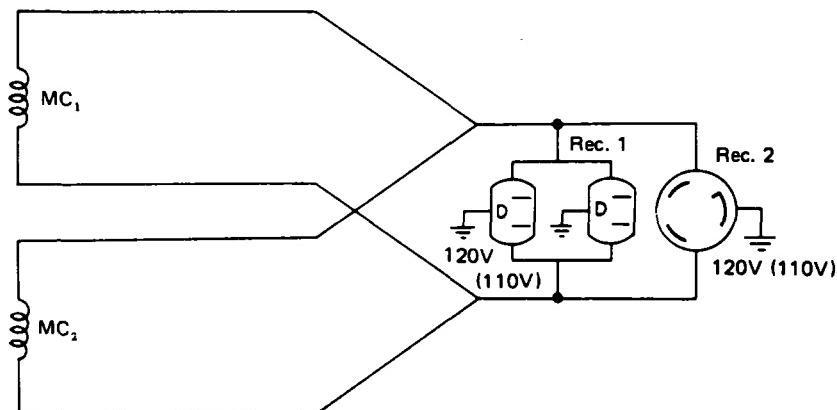
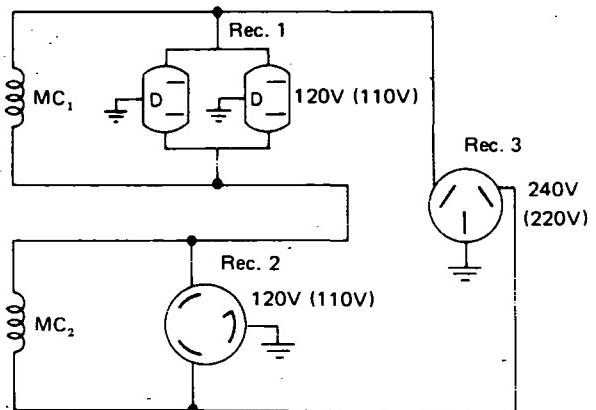


Fig. 5-10



Switch Position	LOWER VOLTAGE RECEPTACLE	HIGHER VOLTAGE RECEPTACLE
110V or 120V	Rated output	No output can be taken.
110/220V or 120/240V	Half of rated output	Rated output

Table 5-4

Fig. 5-11

Two main coils are wound over stator core. Each main coil outputs half the rated power at the lower voltage (110V or 120V). These main coils are wound to be in the same phase. The full power switch reconnects these main coils in parallel or in series.

Fig. 5-9 shows a circuit diagram. When the full power switch is set for single lower voltage indication (110V or 120V), the switch position is as indicated by the lower solid line in the diagram. Fig. 5-10 is a simplified representation of this circuit, showing the two main coils connected in parallel. In this case, the higher voltage (220V or 240V) at Rec. 3 cannot be taken out. Rec. 2 for the lower voltage can output up to the rated power (up to 30A if the rated current is over 30A), and Rec. 1 can output up to a total of 15A. When the full power switch is set for double voltage indication (110V/220V or 120V/240V), the switch position is as indicated by the upper dotted line in Fig. 5-9. Fig. 5-11 is a simplified representation of this circuit, showing the two main coils connected in series. In this case, power can be taken simultaneously from the receptacles for both voltages. Rec. 3 for the higher voltage can output up to the rated power, but Rec. 1 and Rec. 2 for the lower voltage can output only up to half the rated power each.

Table 5-4 is a summary of the above explanation. Select the proper output voltage by full power switch in accordance with the appliance to be used.

5-3-4 VOLTAGE CHANGEOVER SWITCH

The generator of 50Hz 110V/220V dual voltage type for U.K. is provided with voltage changeover switch instead of full power switch.

The output voltage is selected from 110V and 220V by turning this switch and both voltages cannot be taken out simultaneously.

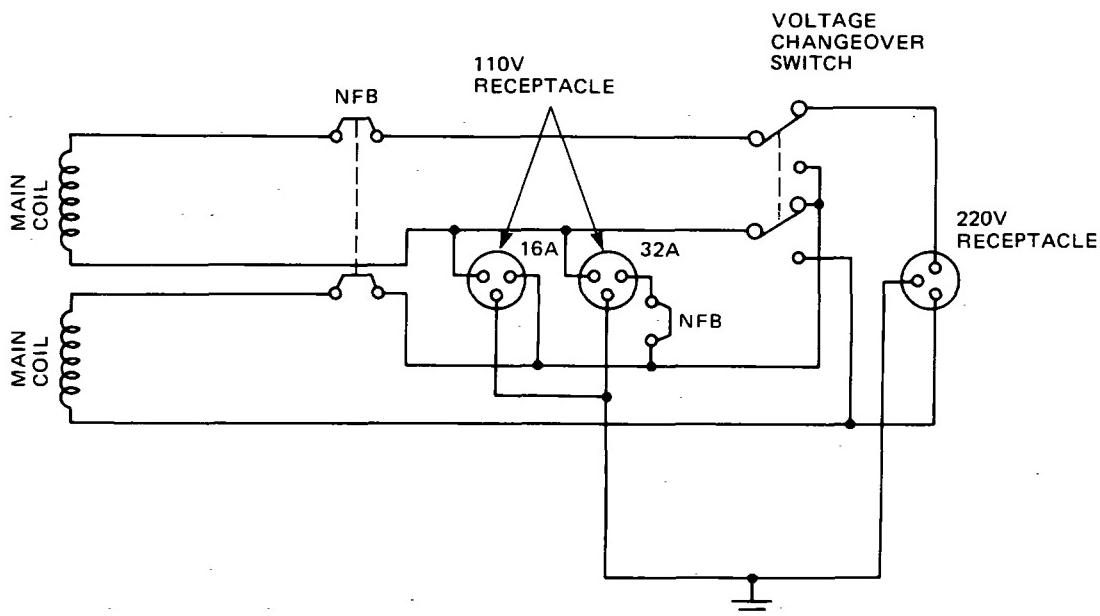


Fig. 5-12

6. SAFETY PRECAUTIONS

1. Use extreme caution near fuel. A constant danger of explosion or fire exists.

Do not fill the fuel tank while the engine is running. Do not smoke or use open flame near the fuel tank. Be careful not to spill fuel when refueling. If spilt, wipe it and let dry before starting the engine.

2. Do not place inflammable materials near the generator.

Be careful not to put fuel, matches, gunpowder, oily cloth, straw, and any other inflammables near the generator.

3. Do not operate the generator in a room, cave or tunnel. Always operate in a well-ventilated area.

Otherwise the engine may overheat and also, the poisonous carbon monoxide contained in the exhaust gases will endanger human lives. Keep the generator at least 1 m (4 feet) away from structures or facilities during use.

4. Operate the generator on a level surface.

If the generator is tilted or moved during use, there is a danger of fuel spillage and a chance that the generator may tip over.

5. Do not operate with wet hands or in the rain.

Severe electric shock may occur. If the generator is wet by rain or snow, wipe it and thoroughly dry it before starting.

Don't pour water over the generator directly nor wash it with water.

If the generator is wet with water, the insulations will be adversely affected and may cause current leakage and electric shock.

6. Do not connect the generator to the commercial power lines.

This may cause a short-circuit or damage to the generator. Use a transfer switch for connecting with indoor wiring.

NOTE: The parts numbers of the transfer switches and of the plastic box to store them are as shown in Table 6-1.

Part No.	Part Name	Q'ty	Phase	Allowable Current
365-45604-08	Transfer Switch	1	1	15A
367-45605-08	Transfer Switch	1	1	30A
340-45606-08	Transfer Switch	1	1	60A
367-43008-08	Plastic Box	1	1	30A
348-43009-08	Plastic Box	1	1	60A

Table 6-1

7. Be sure to check and remedy the cause of circuit breaker tripping before re-setting it on.

CAUTION :If the circuit breaker tripped off as a result of using an electrical appliance, the cause can be an overload or a short-circuit. In such a case, stop operation immediately and carefully check the electrical appliance and AC plugs for faulty wiring.

7. RANGE OF APPLICATIONS

Generally, the power rating of an electrical appliance indicates the amount of work that can be done by it. The electric power required for operating an electrical appliance is not always equal to the output wattage of the appliance. The electrical appliances generally have a label showing their rated voltage, frequency, and power consumption (input wattage). The power consumption of an electrical appliance is the power necessary for using it. When using a generator for operating an electrical appliance, the power factor and starting wattage must be taken into consideration.

In order to determine the right size generator, it is necessary to add the total wattage of all appliances to be connected to the unit.

Refer to the followings to calculate the power consumption of each appliance or equipment by its type.

(1) Incandescent lamp, heater, etc. with a power factor of 1.0

Total power consumption must be equal to or less than the rated output of the generator.

Example: A rated 3000W generator can turn thirty 100W incandescent lamps on.

(2) Fluorescent lamps, mercury lamps, etc. with a smaller power factor

Select a generator with a rated output equivalent to 1.2 to 2 times of the power consumption of the load.

Example: A 400W mercury lamp requires 600W to 700W power source to be turned on.
A rated 3000W generator can power four or five 400W mercury lamps.

NOTE1: If a power factor correction capacitor is not applied to the mercury lamp or fluorescent lamp, the more power shall be required to drive those lamps.

A rated 3000W generator can drive one or two 400W mercury lamps without power factor correction capacitors.

NOTE2: Nominal wattage of the fluorescent lamp generally indicates the output wattage of the lamp.

Therefore, if the fluorescent lamp has no special indication as to the power consumption, efficiency should be taken into account as explained in Item (5) on the following page.

(3) Motor driven tools and light electrical appliances

Generally the starting wattage of motor driven tools and light electrical appliances are 1.2 to 3 times larger than their running wattage.

Example: A rated 250W electric drill requires a 400W generator to start it.

(4) Initially loaded motor driven appliances such as water pumps, compressors,etc.

These appliances require large starting wattage which is 3 to 5 times of running wattage.

Example: A rated 900W compressor requires a 4500W generator to drive it.

NOTE1: Motor-driven appliances require the aforementioned generator output only at the starting. Once their motors are started, the appliances consume about 1.2 to 2 times their rated power consumption so that the excess power generated by the generator can be used for other electrical appliances.

NOTE2: Motor-driven appliances mentioned in Items (3) and (4) vary in their required motor starting power depending on the kind of motor and start-up load. If it is difficult to determine the optimum generator capacity, select a generator with a larger capacity.

(5) Appliances without any indication as to power consumption

Some appliances have no indication as to power consumption; but instead the work load (output) is indicated. In such a case, power consumption is to be worked out according to the numerical formula mentioned below.

$$\frac{\text{(Output of electrical appliance)}}{\text{(Efficiency)}} = \text{(Power consumption)}$$

Efficiencies of some electrical appliances are as follows:

Single-phase motor	0.6 ~ 0.75	The smaller the motor, the lower the efficiency.
Three-phase motor	0.65 ~ 0.9	
Fluorescent lamp	0.7 ~ 0.8	

Example 1: A 40W fluorescent lamp means that its luminous output is 40W. Its efficiency is 0.7 and accordingly, power consumption will be $40 \div 0.7 = 57\text{W}$. As explained in **Item(2)**, multiply this power consumption value of 57W by 1.2 ~ 2 and you will get the figure of the necessary capacity of a generator. In other words, a generator with a rated output of 1000W capacity can light nine to fourteen 40W fluorescent lamps.

Example 2: Generally speaking, a 400W motor means that its work load is 400W. Efficiency of this motor is 0.7 and power consumption will be $400 \div 0.7 = 570\text{W}$. When this motor is used for a motor-driven tool, the capacity of the generator should be multiple of 570W by 1.2 to 3 as explained in the **Item(3)**.

$$570(\text{W}) \times 1.2 \sim 3 = 684(\text{W}) \sim 1710(\text{W})$$

MODEL	RGV2200		RGV2600		RGV4000		RGV6000	
Frequency	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Incandescent lamp, heater, etc.	1400W	1800W	2000W	2200W	3000W	3500W	4400W	4800W
Fluorescent lamp, mercury lamp, etc.	approx. 700W	approx. 900W	approx. 1000W	approx. 1100W	approx. 1500W	approx. 1800W	approx. 2000W	approx. 2350W
Electric tool etc.	approx. 400W	approx. 400W	approx. 800W	approx. 800W	approx. 1600W	approx. 1600W	approx. 1800W	approx. 2000W
Pump, compressor, etc.	approx. 300W	approx. 400W	approx. 400W	approx. 400W	approx. 750W	approx. 750W	approx. 800W	approx. 800W

Table 7-1

NOTES: Wiring between generator and electrical appliances

1. Allowable current of cable

Use a cable with an allowable current that is higher than the rated input current of the load (electrical appliance). If the input current is higher than the allowable current of the cable used, the cable will become excessively heated and deteriorate the insulation, possibly burning it out.

Table 7-2 shows cables and their allowable currents for your reference.

2. Cable length

If a long cable is used, a voltage drop occurs due to the increased resistance in the conductors decreasing the input voltage to the load (electrical product). As a result, the load can be damaged. Table 7-2 shows voltage drops per 100 meters of cable.

Nominal cross section mm ²	A.W.G. Gauge No.	Allowable current A	No. of strands/strands dia. No. / mm	Resistance Ω / 100 m	Flowing Current							Voltage drop
					1A	3A	5A	8A	10A	12A	15A	
0.75	18	7	30 / 0.18	2.477	2.5V	8V	12.5V	—	—	—	—	
1.27	16	12	50 / 0.18	1.486	1.5V	5V	7.5V	12V	15V	18V	—	
2.0	14	17	37 / 0.26	0.952	1V	3V	5V	8V	10V	12V	15V	
3.5	12 - 10	23	45 / 0.32	0.517	—	1.5V	2.5V	4V	5V	6.5V	7.5V	
5.5	10 ~ 8	25	70 / 0.32	0.332	—	1V	2V	2.5V	3.5V	4V	5V	

Table 7-2

$$\text{Voltage drop indicates as } V = \frac{1}{100} \times R \times I \times \ell$$

R means resistance (Ω / 100 m) on the above table.

I means electric current through the wire (A).

ℓ means the length of the wire (m).

The length of wire indicates round length, it means twice the length from generator to electrical tools.

8. MEASURING PROCEDURES

8-1 MEASURING INSTRUMENTS

8-1-1 "Dr. ROBIN" GENERATOR TESTER

The "Dr. Robin" generator tester is exclusively designed for fast, easy diagnosis and repair of Robin generators.

The "Dr. Robin" has the following features:

- (1) Functions of voltmeter, frequency meter, megger, capacitance meter and circuit tester are combined in one unit.
- (2) Fast and easy readout by digital indicator.
- (3) Built-in automatic battery checker indicates the time to change batteries.
- (4) Tester and accessories are installed in a handy, sturdy case for easy carrying.

● SPECIFICATIONS

Model		Dr. Robin
Part Number		388-47565-08
Measuring Range	Voltage	0~500V AC
	Frequency	25~70Hz
	Resistance	0.1~1,999 Ω
	Condenser Capacity	10~100 μF
	Insulation Resistance	3MΩ
Circuit Protector		Fuse
Power Source		2 × 6F44P (006P) Dry Cell Battery
Accessories		Test leads with needle probes . . . 1 set Test leads with jack plugs 1 set
Dimensions (L × W × H)		285 mm × 200 mm × 110 mm
Weight		1.6kg

Table 8-1

The "Dr. Robin" generator tester can be ordered from Robin generator distributors by the following part number.

Dr. Robin Part Number : 388-47565-08

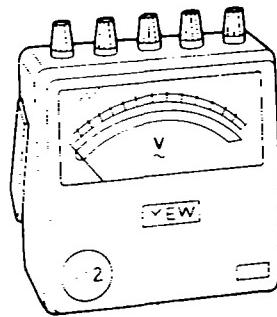
If you do not have a "Dr. Robin" generator tester, use the instruments described in the following section for checking generator parts.

8-1-2 INSTRUMENTS

(1) VOLTMETER

AC voltmeter is necessary. The approximate AC voltage ranges of the voltmeters to be used for various types of generators are as follows:

- 0 to 150V: Type with an output voltage of 110 or 120V
- 0 to 300V: Type with an output voltage of 220, 230 or 240V
- 0 to 150V, 0 to 330V: Dual voltage type

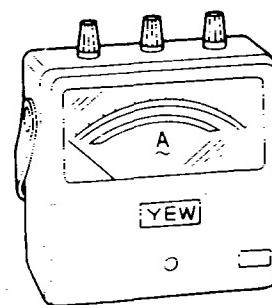


FOR AC

Fig. 8-2

(2) AMMETER

AC ammeter is necessary. An AC ammeter with a range that can be changed according to the current rating of a given generator is most desirable. (About 10A, 20A, 100A)



FOR AC

Fig. 8-3

(3) FREQUENCY METER

Frequency range : About 45 to 65Hz

NOTE: Be careful of the frequency meter's input voltage range.

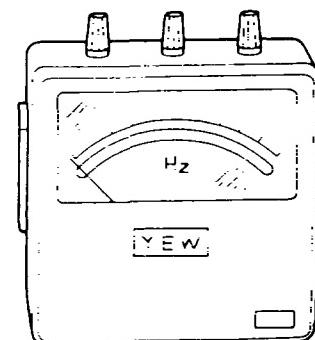


Fig. 8-4

(4) CIRCUIT TESTER

Used for measuring resistance, etc.

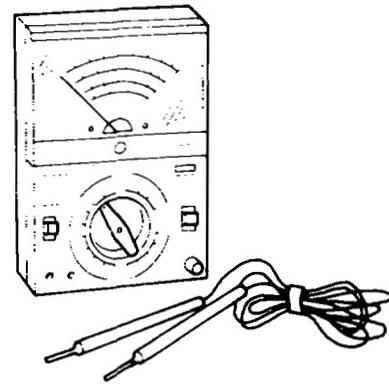


Fig. 8-5

(5) MEGGER TESTER

Used for measuring generator insulation resistance.

Select one with testing voltage range of 500V.

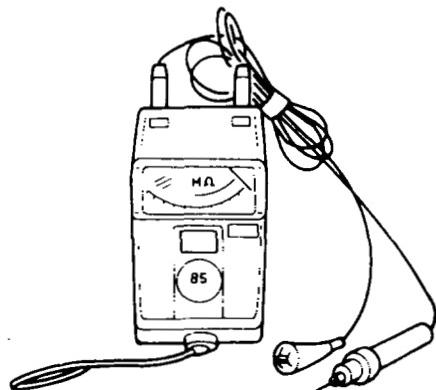


Fig. 8-6

(6) ENGINE TACHOMETER

There are various types of tachometers, such as contactless type, contact type, and strobe type. The contact type can be used only when the generator and engine have been disassembled. The contactless type is recommended.

The PET-2100E engine tachometer is available from your Robin distributors.

Please inquire by the part number PET-2100E.

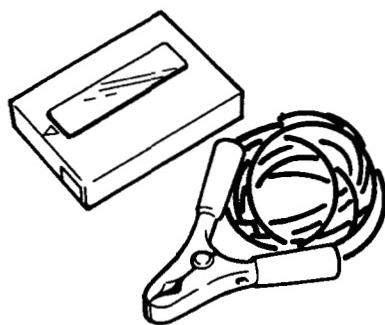


Fig. 8-7

8-2 AC OUTPUT MEASURING

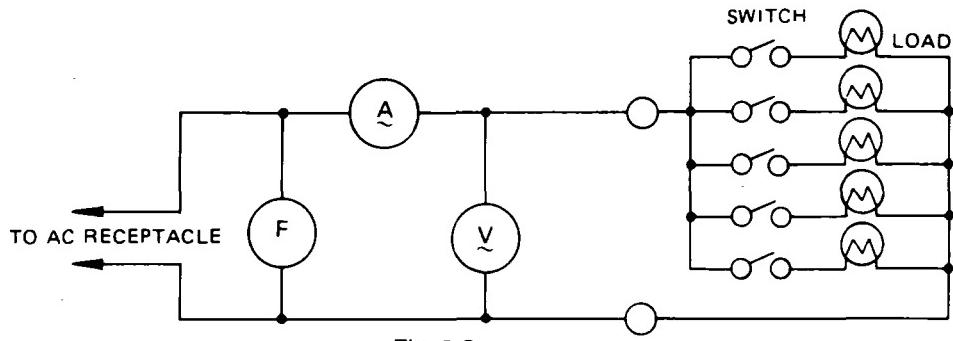


Fig. 8-8

Use a circuit like the shown in Fig.8-8 for measuring AC output. A hot plate or lamp with a power factor of 1.0 may be used as a load. Adjust the load and rpm. and check that the voltage range is as specified in Table 8-2 at the rated amperage and rated rpm.

Rated voltage	110V	120V	220V	240V
Voltage range	99~121V	108~132V	198~242V	216~264V

Table 8-2

8-3 MEASURING INSULATION RESISTANCE

Use a "Dr. Robin" generator tester in megger tester mode or use a megger tester to check the insulation resistance. Connect a megger tester to one of receptacle output terminals and the ground terminal, then measure the insulation resistance. An insulation resistance of 1 megohm or more is normal. (The original insulation resistance at the time of shipment from the factory is 10 megohm or more.)

If it is less than 1 megohm, disassemble the generator and measure the insulation resistance of the stator, rotor and control panel individually.

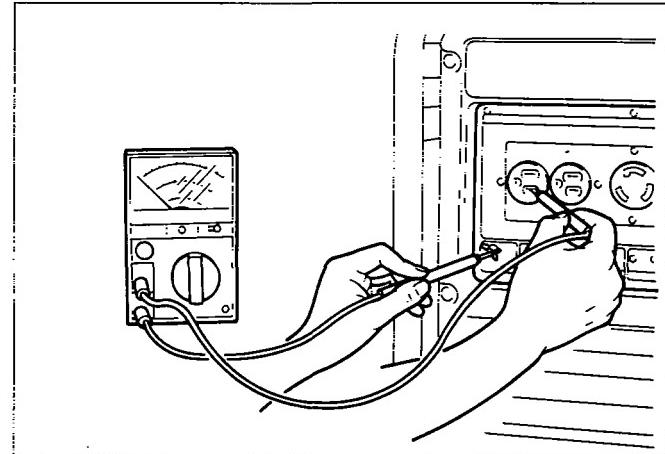


Fig. 8-9

● STATOR

- (1) Measure the insulation resistance between BLUE lead and the core.
- (2) Measure the insulation resistance between WHITE lead and the core.
- (3) Measure the insulation resistance between YELLOW lead and the core.
- (4) Measure the insulation resistance between BROWN lead and the core.

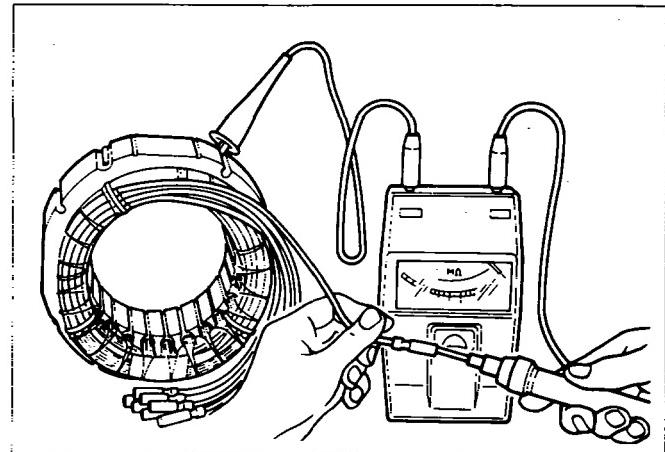


Fig. 8-10

● ROTOR

Measure the insulation across one of the soldered terminals of the rotor and the core.

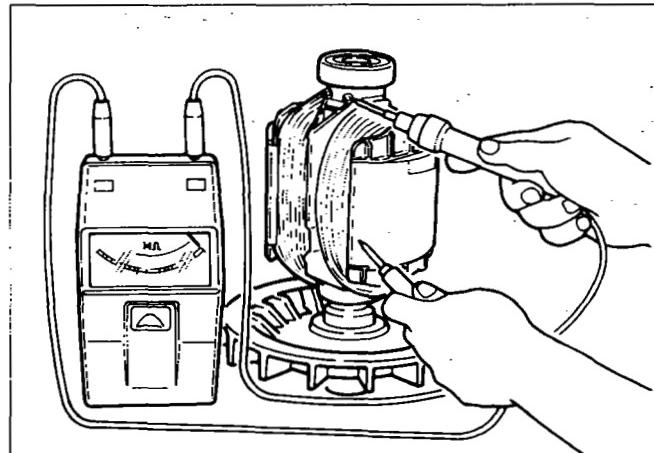


Fig. 8-11

● CONTROL PANEL

Measure the insulation resistances between the live parts and the grounded parts.

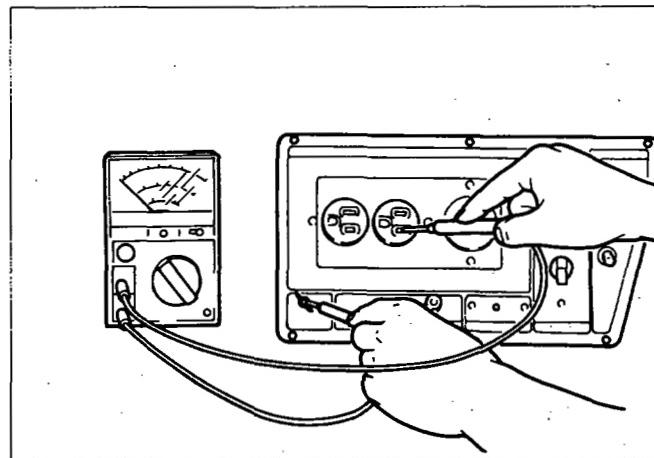


Fig. 8-12

Any part where the insulation resistance is less than $1M\Omega$ has faulty insulation, and may cause electric leakage and electric shock.

Replace the faulty part.

9. CHECKING FUNCTIONAL MEMBERS

9-1 PILOT LAMP and VOLTMETER

Check the pilot lamp and the voltmeter if it is turned on by applying specific voltage.

Pilot lamp and voltmeter cannot be checked with circuit tester because its resistance is too large.
(See Fig.9-1.)

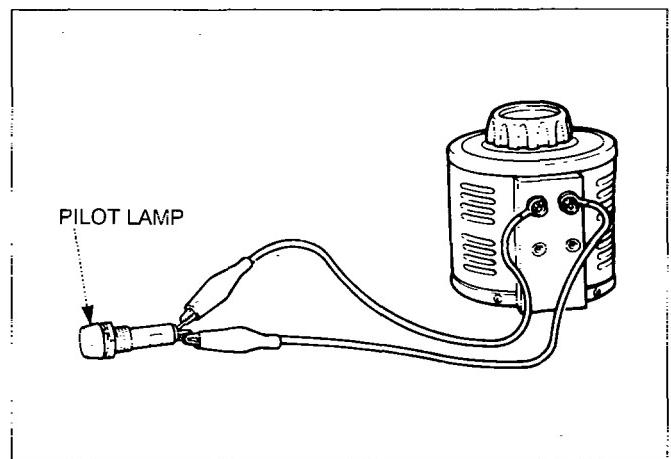


Fig. 9-1

Pilot lamp should be turned on at 70 to 120V.

9-2 AC RECEPTACLES

Using a "Dr. Robin" or a circuit tester, check continuity between the two terminals at the rear of the AC receptacles while the receptacle is mounted on the control panel. When continuity is found between the output terminals of the receptacle with a wire connected across these terminals, the AC receptacle is normal. When the wire is removed and no continuity is found between these terminals, the receptacles are also normal.

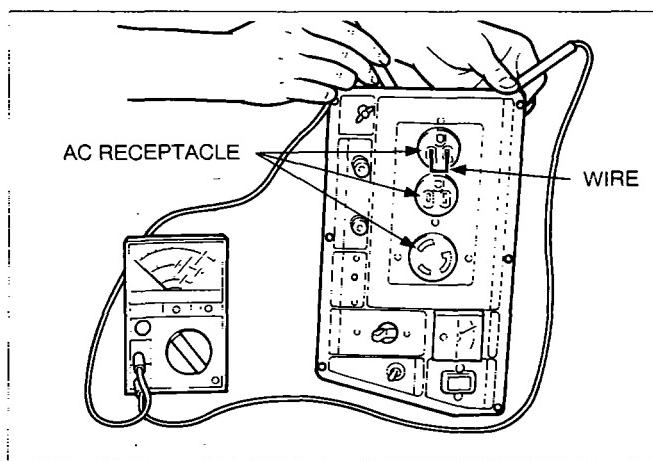


Fig. 9-2A

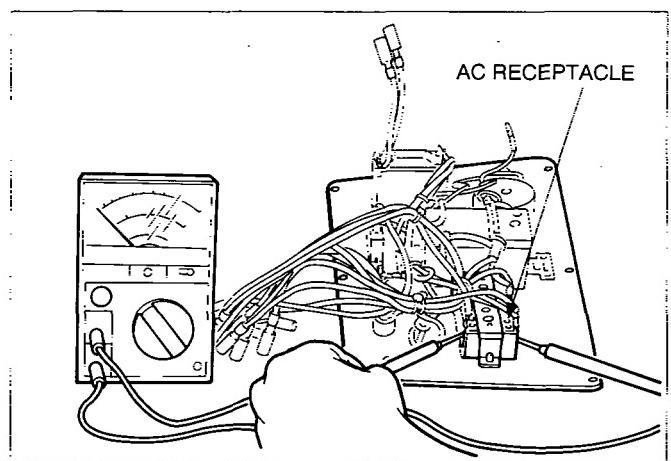


Fig. 9-2B

9-3 CIRCUIT BREAKER

Check continuity between each of two terminals at the rear of the circuit breaker while it is mounted on the control panel. Normally, there is continuity between each of the two when the circuit breaker is on while there is no continuity when the circuit breaker is off.

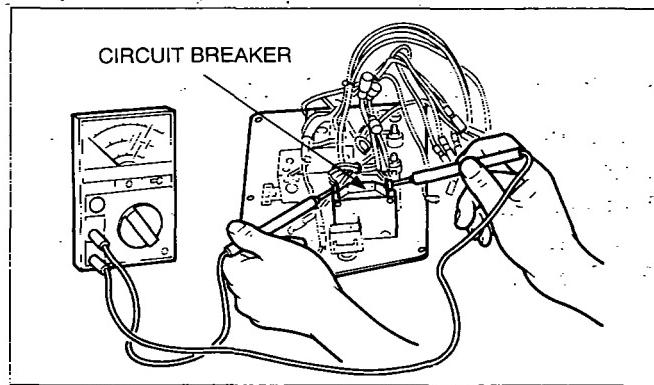


Fig. 9-3

9-4 STATOR

Disengage connectors on the wires from stator and check the resistance between wires with a "Dr. Robin" or a circuit tester referring to the following table.

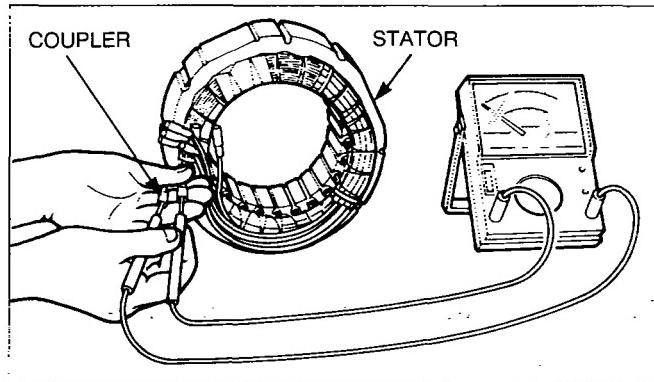


Fig. 9-4

MODEL	Specification		AC Winding		(Rx1Ω ±10%)
	Hz	Voltage	White / Red	Black / Blue	
RGV2200	50	110V, 220V, 110V/220V	1.96	1.96	4.48
		240V	2.33	2.33	4.48
	60	220V, 110V/220V	1.24	1.24	3.46
		120V, 120V/240V	1.24	1.24	3.46
RGV2600	50	110V, 220V, 110V/220V	1.00	1.00	2.64
		240V	1.19	1.19	2.64
	60	220V, 110V/220V	0.75	0.75	1.99
		120V, 120V/240V	0.75	0.75	1.99
RGV4000	50	110V, 220V, 110V/220V	0.70	0.70	1.44
		240V	0.83	0.83	1.44
	60	220V, 110V/220V	0.54	0.54	1.03
		120V, 120V/240V	0.54	0.54	1.03
RGV6000	50	110V, 220V, 110V/220V	0.33	0.33	0.79
		240V	0.39	0.39	0.79
	60	220V, 110V/220V	0.24	0.24	0.56
		120V, 120V/240V	0.24	0.24	0.56

Table 9-1

NOTE: If the circuit tester is not sufficiently accurate, it may not show the values given and may give erroneous readings.

Erroneous readings will also occur when there is a wide variation of resistance among coil windings or when measurement is performed at ambient temperatures different from 20°C(68°F).

9-5 ROTOR ASSEMBLY

- (1) Using a "Dr. Robin" or a circuit tester, measure the resistance of the field coil at the terminals.

$(R \times 1\Omega \pm 10\%)$

MODEL	RGV2200	RGV2600	RGV4000	RGV6000
RESISTANCE	2.52 Ω	2.04 Ω	1.77 Ω	1.60 Ω

Table 9-2

NOTE 1: Because a diode is soldered to the coil ends at the terminals, resistance may be measured only when tester probes touch the terminals in one combination of polarity. Therefore, if no resistance reading appears, try checking in reverse polarity.

NOTE 2: If the circuit tester is not sufficiently accurate, it may not show the values given and may give erroneous readings.

Erroneous reading will also occur when there is a wide variation of resistance among coil windings or when measurement is performed at ambient temperatures different from 20°C(68°F).

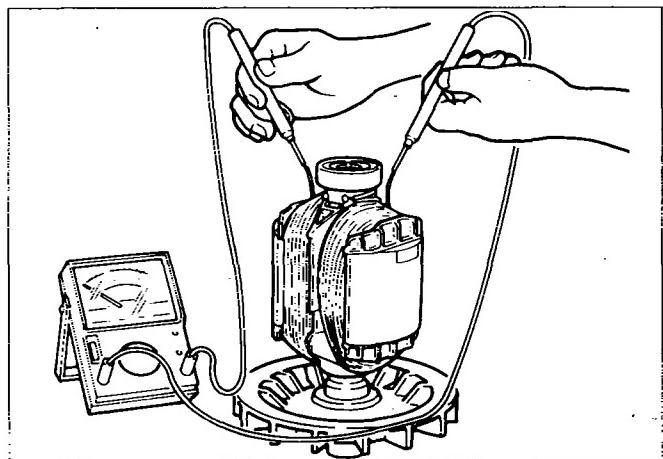
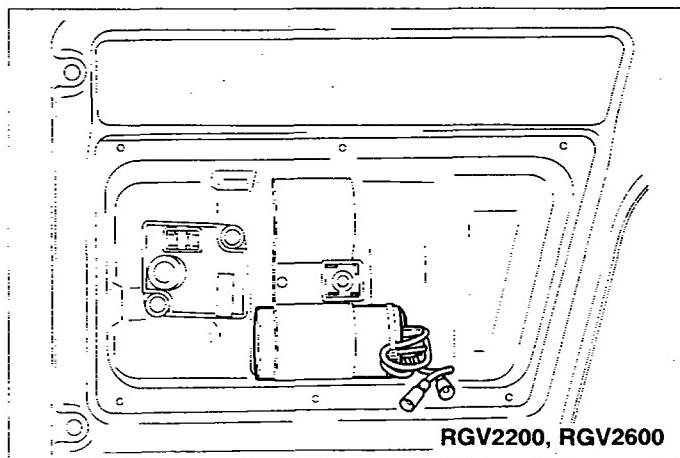


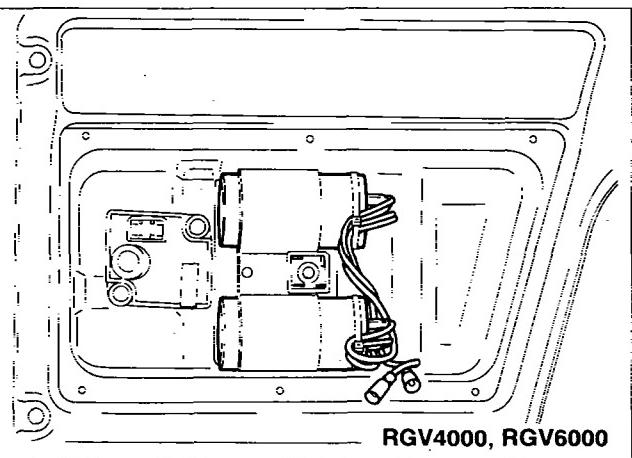
Fig. 9-5

9-6 CONDENSER

- Use a "Dr. Robin" in capacitance meter mode to check the capacity of condensers. (See Fig. 9-6).



RGV2200, RGV2600



RGV4000, RGV6000

Fig. 9-6

NOTE: Be sure to discharge condensers by shorting condenser leads each other before checking their capacitance, or the accurate reading cannot be obtained.

■ NORMAL CAPACITY OF CONDENSER

MODEL	RGV2200	RGV2600	RGV4000	RGV6000
Resistance	$17\mu F$	$24\mu F$	$20\mu F \times 2$	$28\mu F \times 2$

Table 9-3

- If such an instrument is unavailable, the condenser can be checked by replacing with a new one. If the generator performs good with new condenser, the cause of trouble is defect in original condenser.

9-7 DIODE RECTIFIER

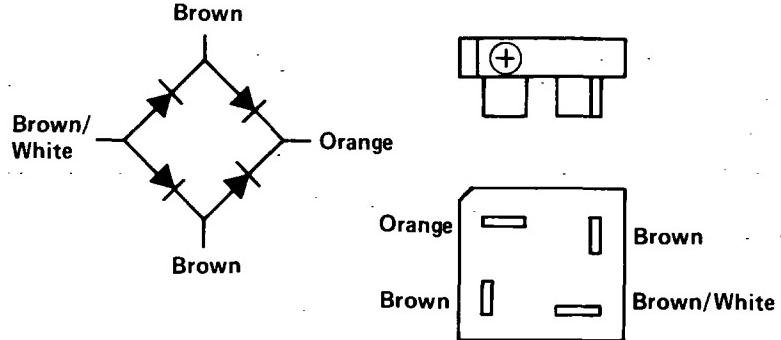


Fig. 9-9

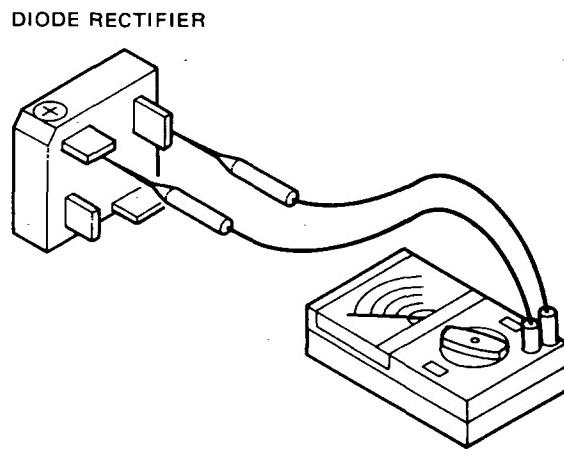


Fig. 9-10

Circuit inside of the diode rectifiers is as shown in Fig. 9-9. Check continuity between each terminal by using a circuit tester as shown in Fig. 9-10. The rectifier is normal when continuity is as follows:

- Checking table for analogue circuit tester.

Analogue circuit tester		Apply black \ominus needle of the circuit tester			
		Brown	Brown	Orange	Brown/White
Apply red \oplus needle of the circuit tester	Brown	No continuity	No continuity	No continuity	Continuity
	Brown	No continuity	No continuity	No continuity	Continuity
	Orange	Continuity	Continuity	No continuity	Continuity
	Brown/White	No continuity	No continuity	No continuity	No continuity

Table 9-4-1

- Checking table for digital circuit tester.

Digital circuit tester		Apply red \oplus needle of the circuit tester			
		Brown	Brown	Orange	Brown/White
Apply black \ominus needle of the circuit tester	Brown		No continuity	No continuity	Continuity
	Brown	No continuity		No continuity	Continuity
	Orange	Continuity	Continuity		Continuity
	Brown/White	No continuity	No continuity	No continuity	

Table 9-4-2

NOTE 1: Because of the difference of measuring method between the analogue circuit tester and the digital circuit tester, polarity of tester needles should be reversed.

NOTE 2: "Continuity" means forward direction characteristics of the diode, and different from short circuit condition (in which a pointer of the tester goes out of its normal scale), shows resistance to some extent. When results of the checking indicates failure even in one section, replace with a new one.

NOTE 3: Some analogue testers like "Simpson" brand operate as same as digital testers.

10. DISASSEMBLY AND ASSEMBLY

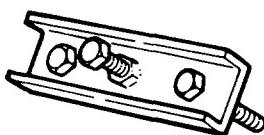
10-1 PREPARATION and PRECAUTIONS

- 1) Be sure to memorize the location of individual parts when disassembling the generator so that the generator can be reassembled correctly. Tag the disassembled part with the necessary information to facilitate easier and smoother reassembly.
- 2) For more convenience, divide the parts into several groups and store them in boxes.
- 3) To prevent bolts and nuts from being misplaced or installed incorrectly, replace them temporarily to their original position.
- 4) Handle disassembled parts with care; clean them before reassembly using a neutral cleaning fluid.
- 5) Use all disassembly/assembly tools properly, and use the proper tool for each specific job.

10-2 SPECIAL TOOLS for DISASSEMBLY and ASSEMBLY

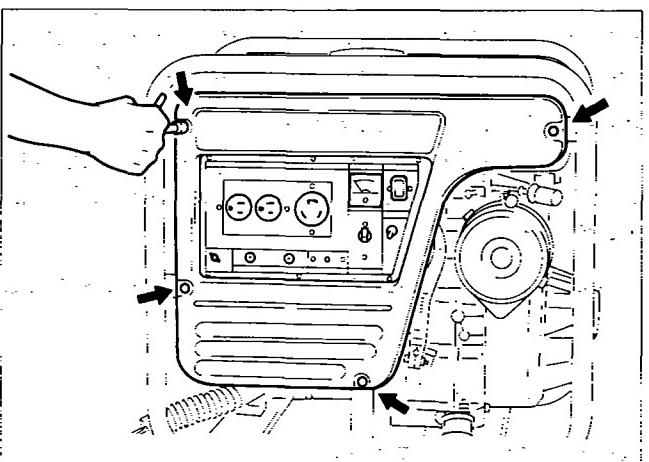
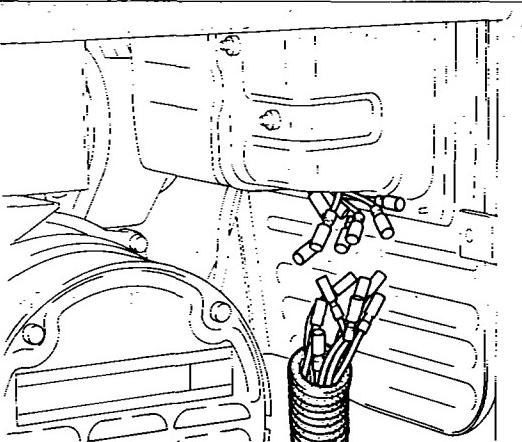
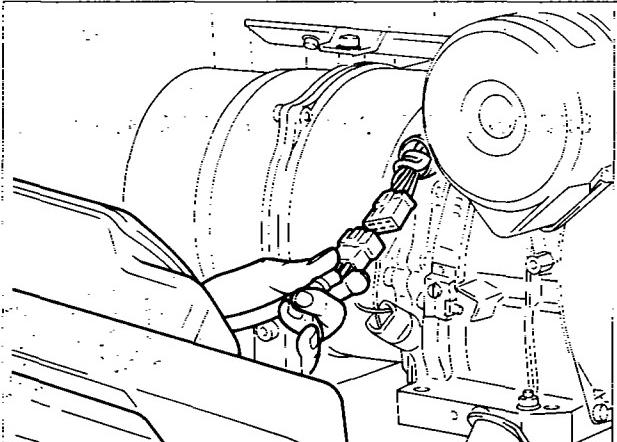
Part Number : 388-95001-07

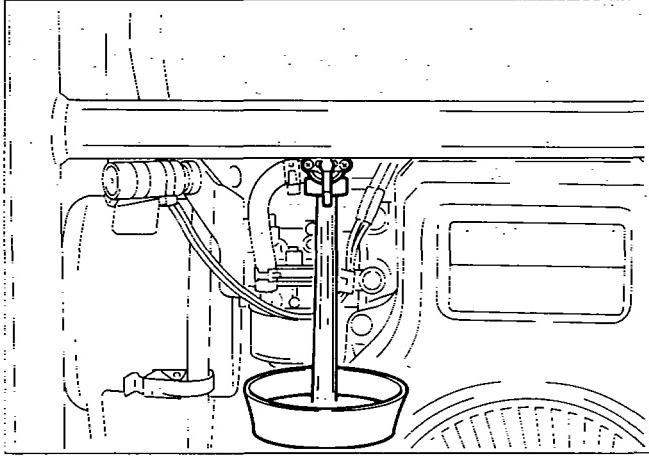
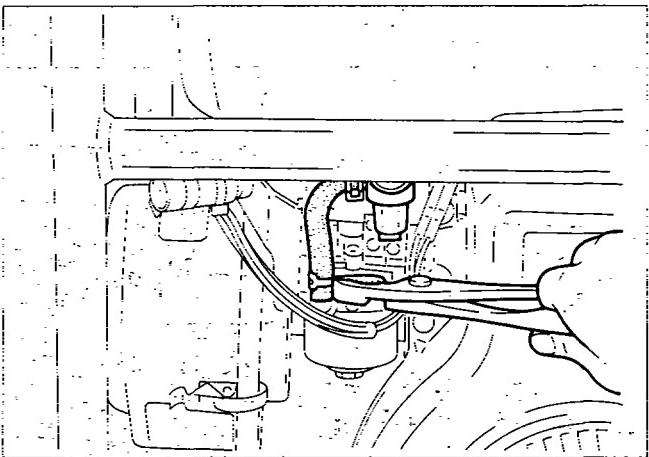
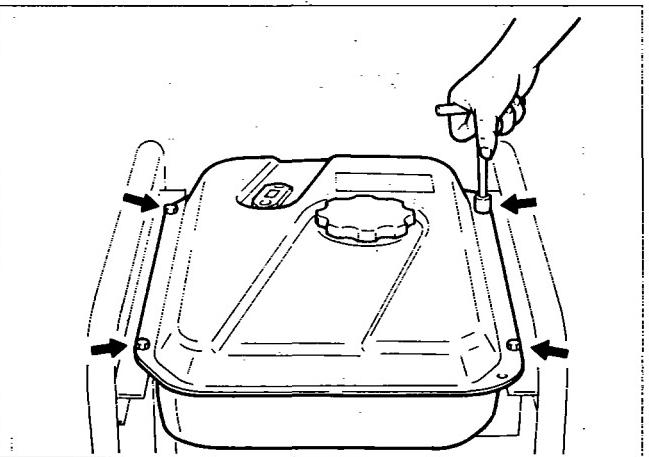
Part Name : REAR COVER PULLER



REAR COVER PULLER

10-3 DISASSEMBLY PROCEDURES

Step	Part to remove	Description	Remarks	Tool
1.	Front Panel	<p>(1) Take off the four bolts and remove the front panel from the frame. (See Fig. 10-1.)</p> <p>(2) Disconnect the connectors on the wiring between the front panel and the engine. (See Fig. 10-2.)</p>		10 mm spanner or box wrench
				
		<p>Fig. 10-1</p>		
		<p>(3) Take off the bushing from the bottom of the front panel. (See Fig. 10-2.)</p> <p>(4) Disconnect the connectors on the wiring from the front panel to the alternator. (See Fig. 10-3.)</p>	<p>Press the upper end of the bushing and pull out.</p>	
				
		<p>Fig. 10-2</p>	<p>Fig. 10-3</p>	

Step	Part to remove	Description	Remarks	Tool
2.	Fuel Tank	<p>(1) Discharge fuel from the tank:</p> <ol style="list-style-type: none"> 1. Shut the fuel strainer. 2. Remove the strainer cup. 3. Put a vessel to receive fuel under the strainer and open the fuel cock to discharge fuel. (See Fig. 10-4.) 4. Attach the strainer cup to the strainer body. 	<p>Use utmost care about fire hazard.</p> <p>Wipe off spilt fuel thoroughly.</p> <p>Do not lose the filter screen.</p>	
			<i>Fig. 10-4</i>	
		<p>(2) Disconnect fuel hose from the strainer. Loosen the hose clamp on the top of the strainer and pull out the fuel hose from the strainer. (See Fig. 10-5.)</p>		Pliers
		<p>(3) Take off the four nuts and remove the fuel tank. (See Fig. 10-6.)</p>		10 mm spanner or box wrench
			<i>Fig. 10-5</i>	
			<i>Fig. 10-6</i>	

Step	Part to remove	Description	Remarks	Tool
3.	Muffler and Muffler Cover	(1) Remove the rear plate from the frame. (Except for RGV6000) 6×12mm flange bolt 2 pcs.	The rear plate is welded to the frame of the RGV6000.	10 mm spanner or box wrench
		(2) Remove the two bolts which fix the muffler to the alternator. Loosen the two nuts on the muffler flange and remove the muffler from the engine. 8×20mm bolt and washer ass'y 2 pcs. 8mm stainless nut 2 pcs. 8mm spring washer for RGV4000 and RGV6000 2 pcs. Muffler gasket 1 pc.		12 mm spanner or box wrench
		(3) Remove the muffler cover 1 and the muffler cover 2 from the muffler. 6×10mm bolt and washer ass'y 8 pcs. (See Fig. 10-8.)		10 mm spanner or box wrench
		(4) For RGV6000 only: Remove the muffler bracket from the rear cover. 8×20mm bolt and washer ass'y 2 pcs.		12 mm spanner or box wrench

MUFFLER COVER 1

MUFFLER

GASKET

MUFFLER COVER 2

MUFFLER BRACKET
for RGV6000 only

Fig. 10-7

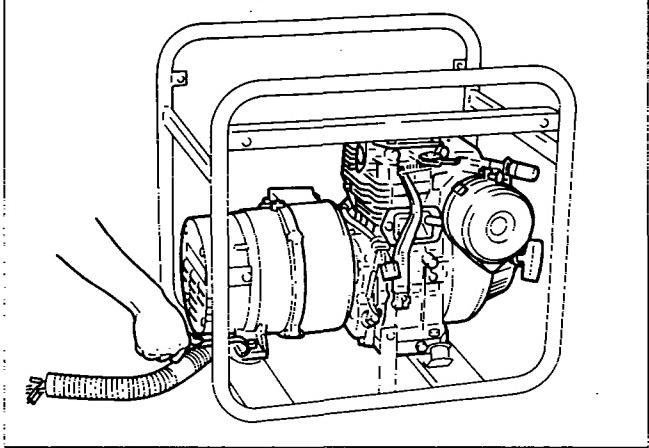
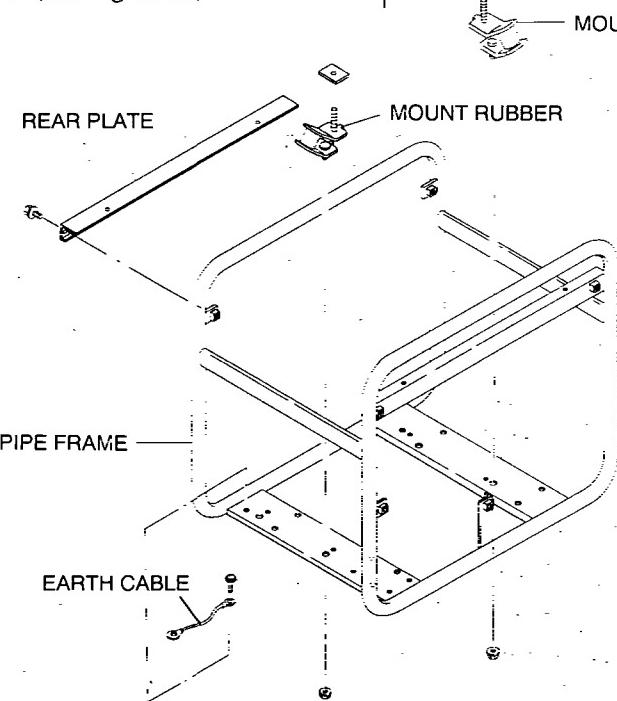
Step	Part to remove	Description	Remarks	Tool
4.	Pipe Frame	(1) For RGV6000: Remove the fuel strainer from the frame. (2) Remove the nuts which are fixing engine and alternator to the mount rubbers. (See Fig. 10-8.)		12 mm spanner
		(3) Using a chain-block, sling up the engine and alternator and dismount from the frame. 	Remove the air cleaner cover for easier dismounting.	
		(4) Remove the mount rubbers from the frame. Loosen the nuts on the bottom side of the frame. (See Fig. 10-9.)		12 mm spanner or box wrench
				

Fig. 10-8

Fig. 10-9

Step	Part to remove	Description	Remarks	Tool
5.	Rear Cover	<p>(1) Remove the end cover. (See Fig. 10-10.) 6ϕ bolt 4 pcs.</p> <p>(2) Take off the rear cover.</p> <ol style="list-style-type: none"> 1. Remove the four bolts which fasten the rear cover to the front cover. 6ϕ bolt 4 pcs. 2. Use a special tool "REAR COVER PULLER" to remove the rear cover. a) Insert the two screws of the special tool into the thread holes of the rear cover. b) Apply the center bolt of the special tool on the head of the through bolt. c) Tighten the center bolt to pull out the rear cover. 	Insert the two screws sufficiently and evenly, or the thread hole may be damaged at removing.	10 mm spanner or box wrench

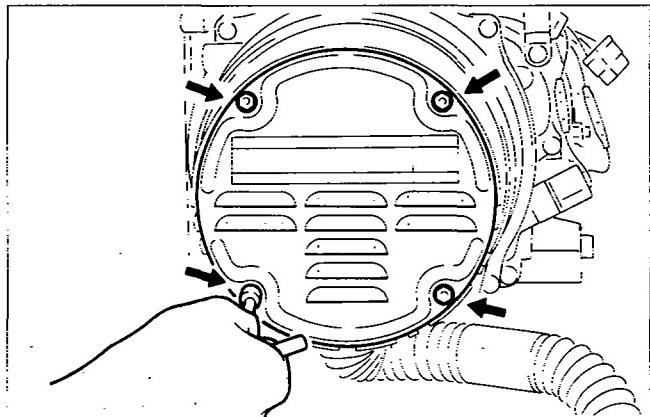


Fig. 10-10

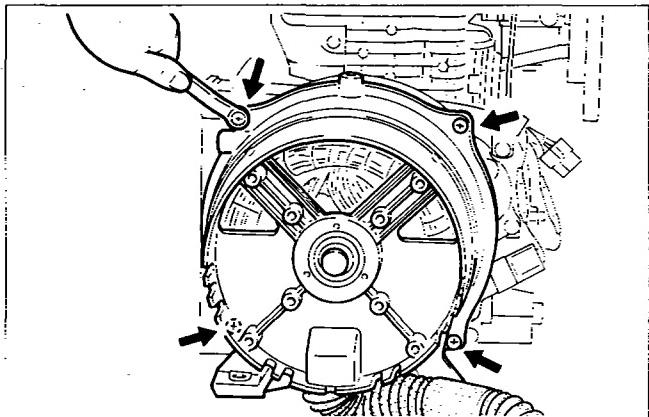


Fig. 10-11

In the case that "REAR COVER PULLER" is unavailable, remove the rear cover by the following instructions.

3. Hit on the boss and legs of rear cover with a plastic hammer to loosen.

Do not give a strong hit on the boss or legs.

Box wrench
Plastic hammer

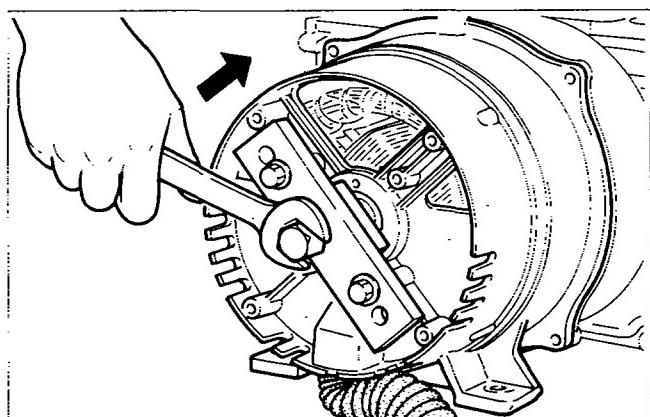


Fig. 10-12

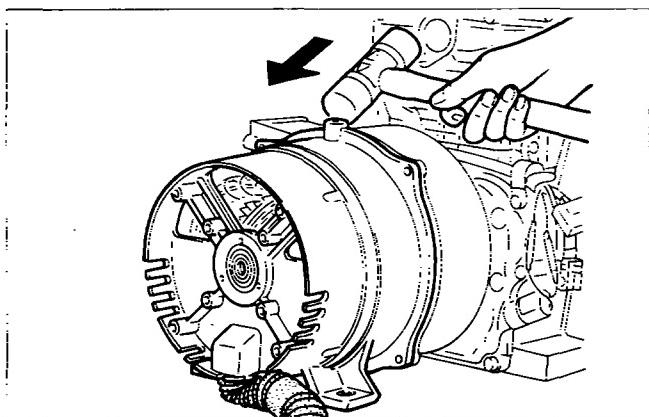
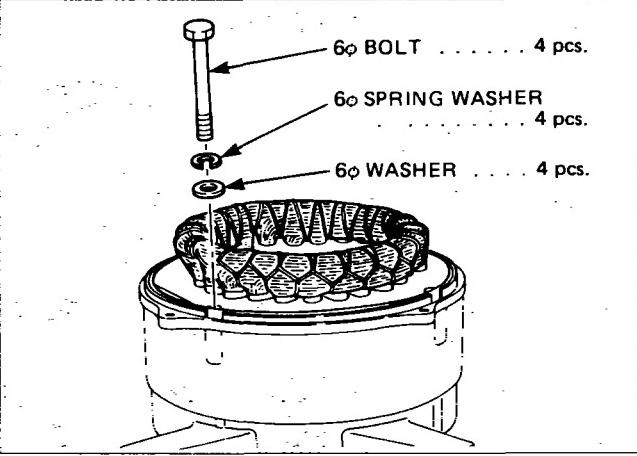
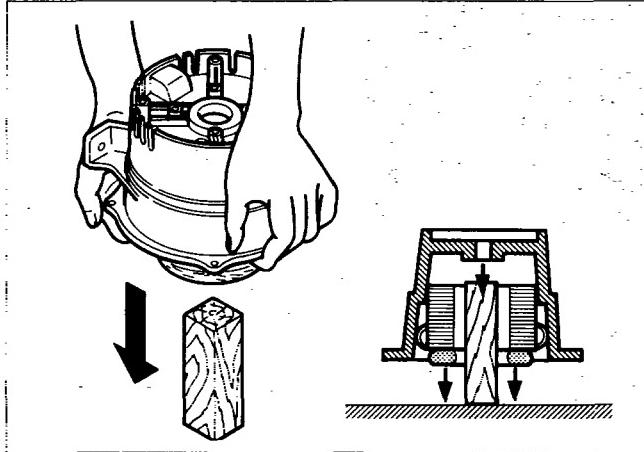
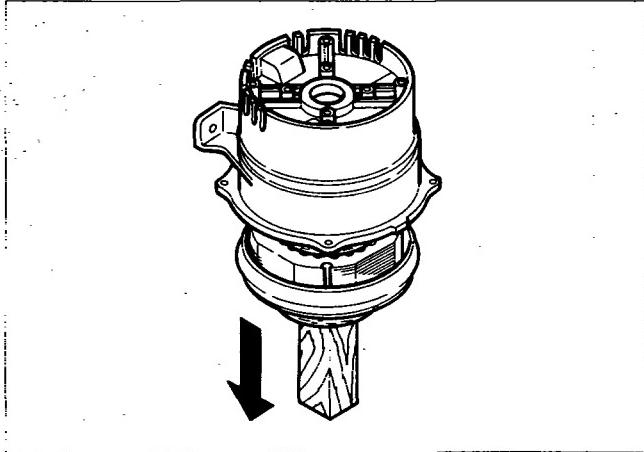
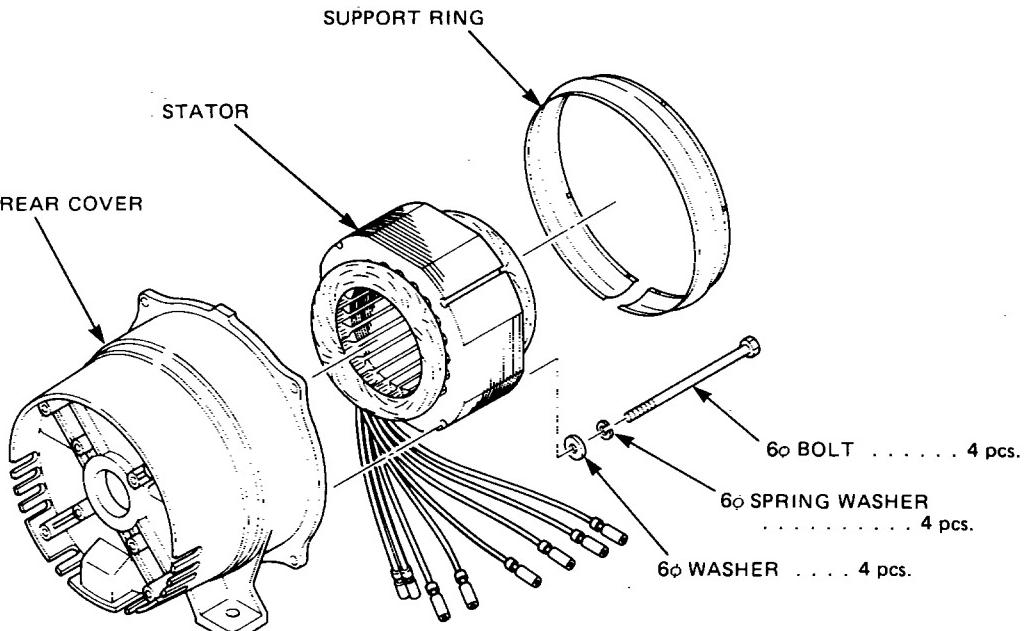
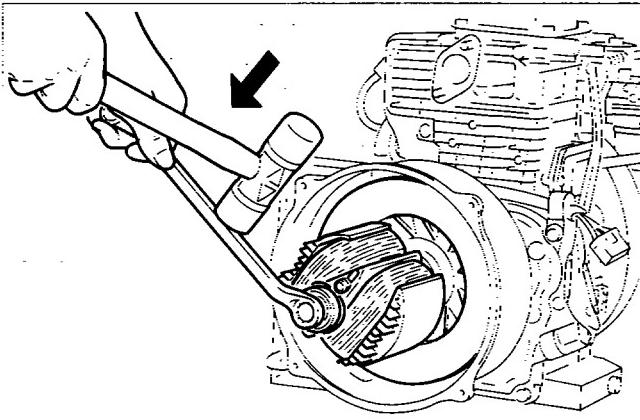


Fig. 10-13

Step	Part to remove	Description	Remarks	Tool
6.	Stator	(1) Remove the four bolts which fasten the stator to the rear cover. (See Fig. 10-14.)		10 mm socket wrench
				
		<i>Fig. 10-14</i>		
		(2) Put a piece of lumber on the floor in upright position. (See Fig. 10-15.)		
		(3) Hold the rear cover and stator upside down with both hands.		
		(4) Down the rear cover and stator over a lumber lightly hitting the bottom of rear cover to the top end of lumber to pull out the stator. (See Fig. 10-16.)		
[NOTES]				
<ol style="list-style-type: none"> 1. Apply fingers to stator coil to keep the stator from dropping on the floor. 2. Gently hit the bottom of rear cover to the top end of lumber several times until the stator comes out loose. 				
				
				
<i>Fig. 10-15</i>			<i>Fig. 10-16</i>	

Step	Part to remove	Description	Remarks	Tool
6.	Stator	(5) Take apart the support ring and stator from rear cover.		
				
7.	Rotor	<p>(1) Take off the through bolt. Apply a box wrench on the head of through bolt. Hit the wrench handle with a hammer counter-clockwise to loosen.</p>		Box wrench Plastic hammer
				
		(2) Put the engine on the working table recoil starter side down.		

Step	Part to remove	Description	Remarks	Tool
7.	Rotor	<p>(3) Use a bolt and oil as a tool for pulling out rotor in the following procedures :</p> <ol style="list-style-type: none"> 1. Pour engine oil into the center hole of rotor shaft. Fill with oil to the shaft end. (See Fig. 10-19.) 2. Prepare a bolt with the following thread size: RGV2200, 2600 M10×P1.25 RGV4000, 6000 M12×P1.50 3. Apply a few turns of seal tape around the tip of the bolt. (See Fig. 10-20.) 		

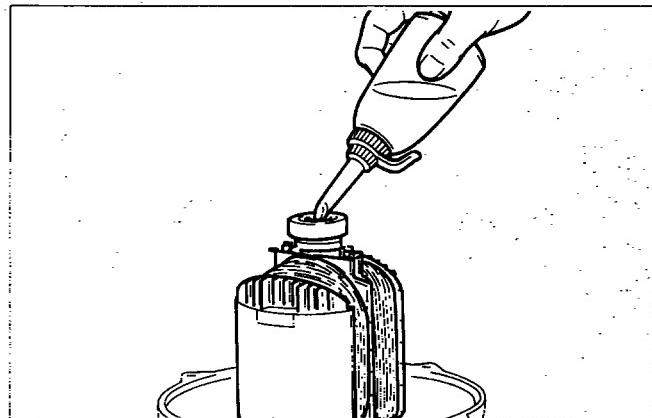


Fig. 10-19

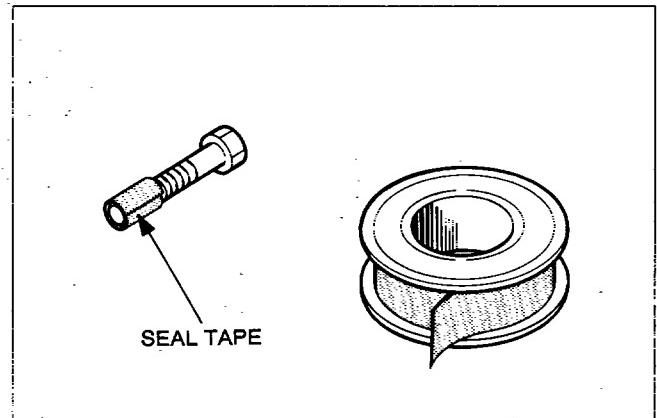


Fig. 10-20

	<p>4. Screw the bolt into the thread of the rotor shaft.</p> <p>5. Torque the bolt using a socket wrench until the rotor comes off loose.</p> <p>* The hydraulic pressure inside the rotor shaft takes apart the rotor from the engine shaft.</p> <p>(4) Wipe off oil thoroughly from rotor shaft and engine PTO shaft.</p>	<p>Do not stick out your face over the rotor. It may jump up on separation.</p>	Socket wrench

Fig. 10-21

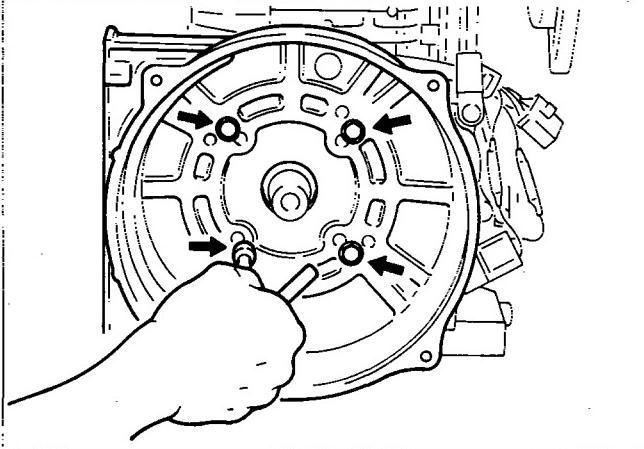
Step	Part to remove	Description	Remarks	Tool
8.	Front Cover	<p>(1) Remove the front cover. Loosen the four bolts and remove the front cover. 8ϕ bolt 4 pcs.</p> 		12 mm Socket wrench

Fig. 10-22

10-4 ASSEMBLY PROCEDURES

10-4-1 FRONT COVER

Attach the front cover to the engine main bearing cover. Match the faucet joint and tighten the bolts.

M8 × 18mm bolt 4 pcs.

M8 spring washer 4 pcs.

Tightening torque
120~140 kg·cm
11.8~13.7 N·m
8.7~10.1 ft·lbs

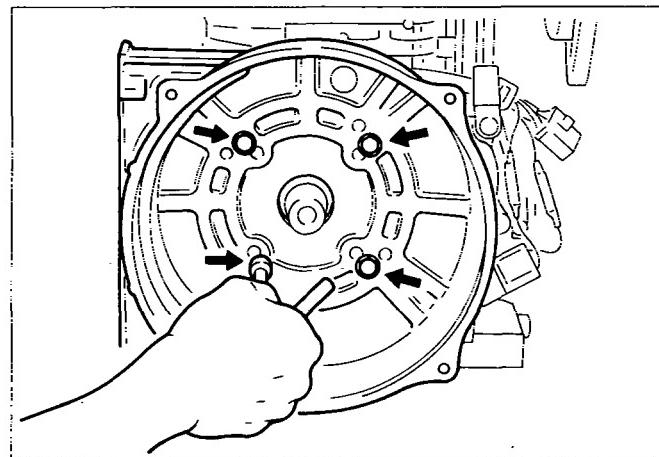


Fig. 10-23

10-4-2 ROTOR

(1) Wipe off oil, grease and dust from the tapered portion of engine shaft and matching tapered hole of rotor shaft.

(2) Mount the rotor to the engine shaft.

Tighten the through bolt.

Apply a wrench on the through bolt and hit wrench handle clockwise with a hammer to tighten.

If an impact wrench is available, use it.

Tightening torque :

Tightening torque	
RGV 2200, 2600	115~135 kg·cm 11.3~13.2 N·m 8.7~10.8 ft·lbs
RGV 4000, 6000	230~250 kg·cm 22.5~24.5 N·m 16.6~19.5 ft·lbs

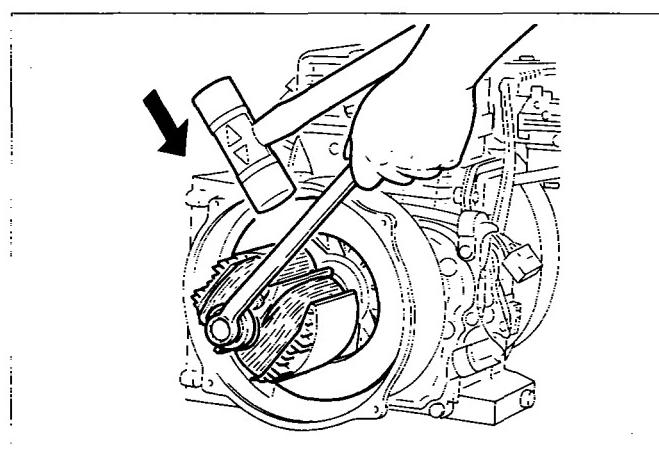


Fig. 10-24

10-4-3 STATOR

- (1) Put the stator in the rear cover setting the four grooves on the side of stator with thread holes of the rear cover.

Tighten the four bolts tentatively to check if the grooves and thread holes are aligned correctly. (See Fig.10-25.)

NOTE : Be careful not to give cuts to wires when pulling them out from the rear cover.

- (2) Remove the four bolts.

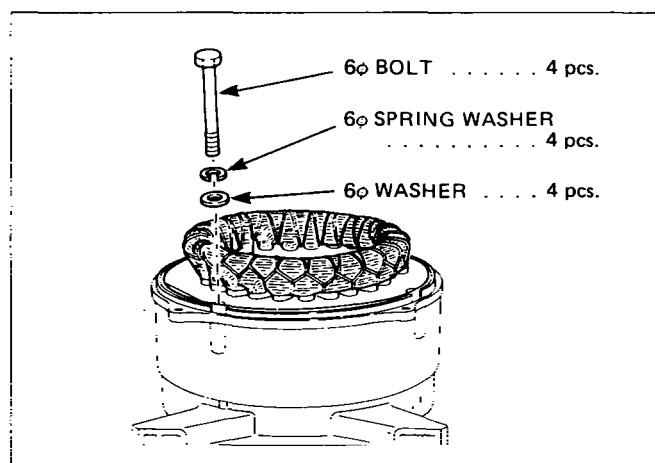


Fig. 10-25

- (3) Apply the support ring between the rear cover and Tap on the support ring evenly using an aluminum bar and a hammer to press into the rear cover. (See Fig.10-26.)

- (4) Join the stator to rear cover with four bolts, washers and spring washers. (See Fig.10-25.)

M6 bolt 4 pcs.

M6 washer 4 pcs.

M6 spring washer 4 pcs.

Tightening torque

80~100 kg·cm

7.8~9.8 N·m

5.8~7.2 ft·lbs

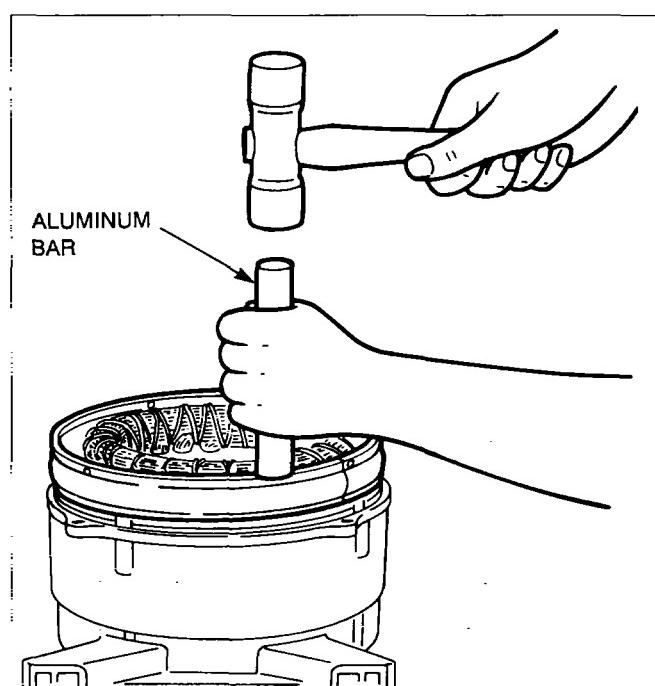
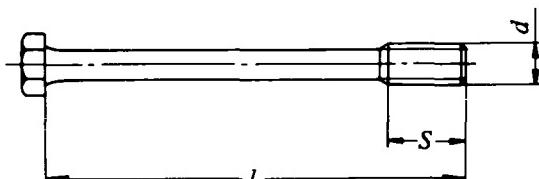


Fig. 10-26

NOTE : Tighten four bolts evenly taking several steps.

- The dimensions of the stator bolts are shown in Table 10-1.



MODEL	<i>l</i>	<i>s</i>	<i>d</i>
RGV2200	65 mm 2.56 inch	15 mm 0.59 inch	M6 × 1.0
RGV2600	85 mm 3.35 inch	20 mm 0.79 inch	M6 × 1.0
RGV4000	95 mm 3.74 inch	20 mm 0.79 inch	M6 × 1.0
RGV6000	115 mm 4.53 inch	40 mm 1.57 inch	M6 × 1.0

Table 10-1

10-4-4 REAR COVER

(1) Attach the bushing over the lead wire drawn out from the rear cover.

Press the smaller end of the bushing into the window of the rear cover. (See Fig.10-27.)

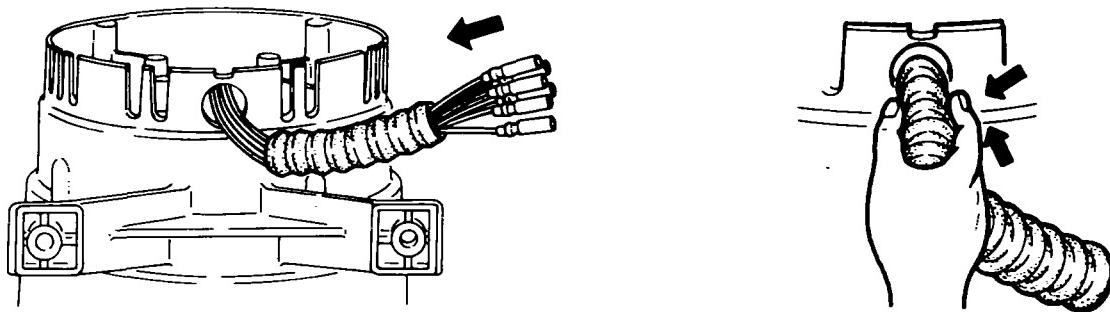


Fig. 10-27

(2) Put the rear cover with stator over the rotor.

Tap on the rear cover evenly with a plastic hammer to press the rotor bearing into the rear cover.

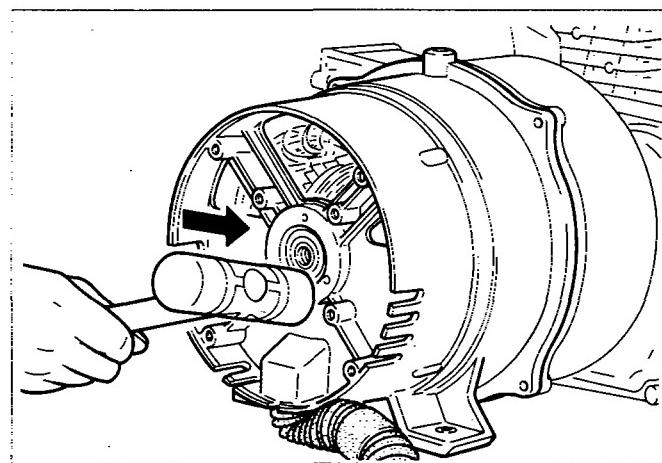


Fig. 10-28

(3) Fix the rear cover to the adaptor with four bolts, spring washers, and washers.

M6 × 25 mm bolt 4 pcs.

M6 spring washer 4 pcs.

M6 washer 4 pcs.

Tightening torque	
50~60	kg·cm
4.9~5.9	N·m
3.6~4.3	ft·lbs

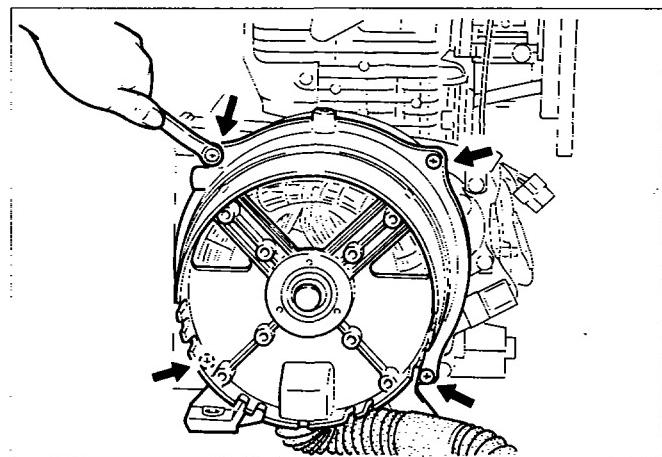


Fig. 10-29

10-4-5 END COVER

Attach the end cover to the rear cover.

M6 × 8mm flange bolt 4 pcs.

Tightening torque

40~60 kg·cm

3.9~5.9 N·m

2.9~4.3 ft·lbs

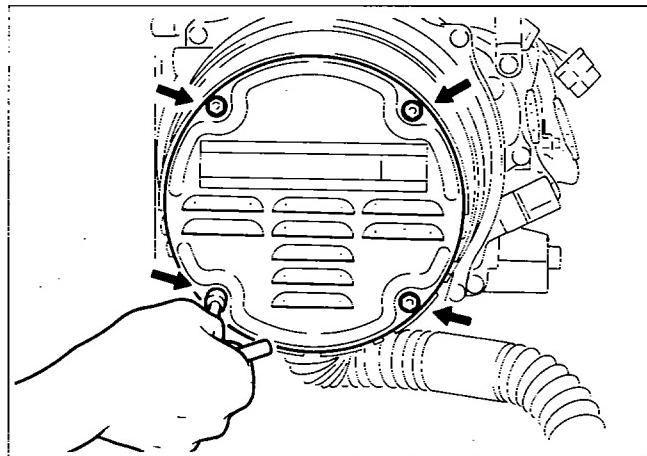


Fig. 10-30

10-4-6 FRAME

(1) Attach the mount rubbers to the frame.

Insert the setting tongue of mount rubber into the hole on the frame and tighten the nut from the bottom of the frame.

M8 flange nut 4 pcs.

Tightening torque

120~140 kg·cm

11.8~13.7 N·m

8.7~10.8 ft·lbs

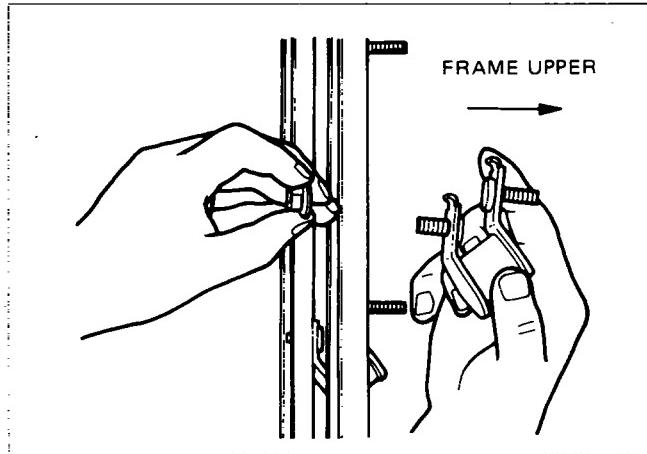


Fig. 10-31

NOTE : The mount rubbers are selected to reduce vibration most effectively by model.

Be sure to use the correct mount rubber for your generator.

Although mount rubbers have the same appearance, their characteristics are different.

(2) Attach the 5 mm terminal of the grounding wires (green/yellow) to the unpainted thread hole of the frame base plate using a 5 mm brass screw.

(3) Install the engine and alternator assembly into the frame.

Put the engine and alternator assembly into the frame from the side of it.

Tighten the nuts over the mount rubber bolts to fix.

M8 nuts 4 pcs.

Tightening torque	
120~140	kg•cm
11.8~13.7	N•m
8.7~10.1	ft•lbs

NOTE : Remove the air cleaner cover for easier installation.

NOTE : When tightening the nuts, slightly lift the engine and alternator assembly so that the weight is not applied to the mount rubbers.

(4) Fasten the other earth cable with 5 mm terminal

to the unpainted bolt hole on the frame.

(See Fig.10-32.)

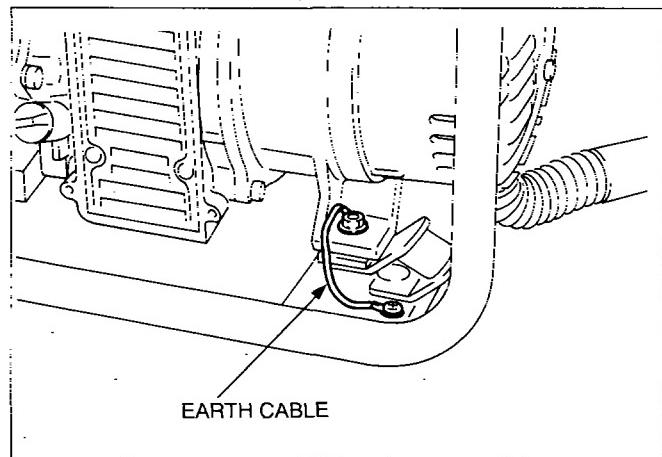


Fig. 10-32

(5) Attach the rear plate frame.

(For RGV2200, 2600, 4000 only)

M6 × 10 mm bolt 2 pcs.

Attach fuel tank mount rubbers to rear plates.

The nuts for mount rubbers are welded to rear plates.

Tightening torque	
40~60	kg•cm
3.9~5.9	N•m
2.9~4.3	ft•lbs

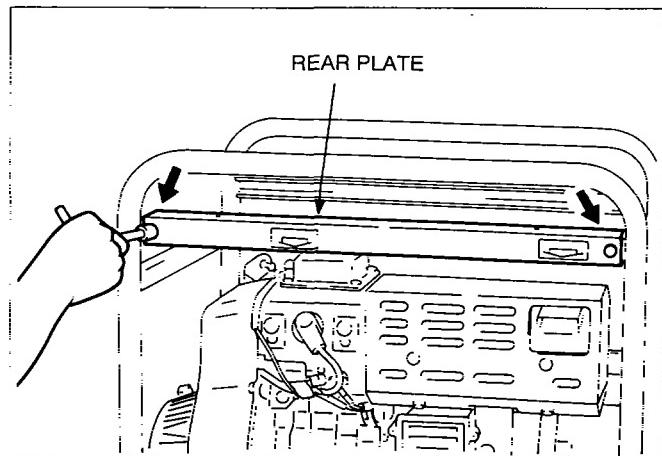


Fig. 10-33

10-4-7 MUFFLER and MUFFLER COVER

(1) For RGV6000 only:

Attach the muffler bracket to the rear cover. Tighten the bolts temporarily.

(2) Attach the muffler cover 1 and the muffler cover 2 to the muffler.

M6 × 10mm bolt and washer Ass'y 8 pcs.

Tightening torque
80~100 kg·cm
7.9~9.8 N·m
5.8~7.2 ft·lbs

(3) Put the muffler gasket to the engine.

(4) Attach the muffler with muffler cover to the engine and the rear cover.

① Tighten the two nuts for the muffler first.

Use the spring washers for RGV4000 and RGV6000.

8mm stainless nut 2 pcs.

8mm spring washer 2 pcs.

(for RGV4000 and RGV6000 only)

Tightening torque
220~280 kg·cm
21.6~27.4 N·m
15.8~20.2 ft·lbs

② Tighten the bolts to fix the muffler to the rear cover.

M8 × 20mm bolt and washer Ass'y

..... 2 pcs. (for RGV2200, 2600, 4000)

Tightening torque
190~250 kg·cm
18.6~24.5 N·m
13.7~18.0 ft·lbs

③ For RGV6000 only:

Tighten the two bolts to fix the muffler bracket to the rear cover, and then the two bolts for the muffler to the muffler bracket.

M8 × 20mm bolt and washer Ass'y

..... 4 pcs. (for RGV6000 only)

Tightening torque
190~250 kg·cm
18.6~24.5 N·m
13.7~18.0 ft·lbs

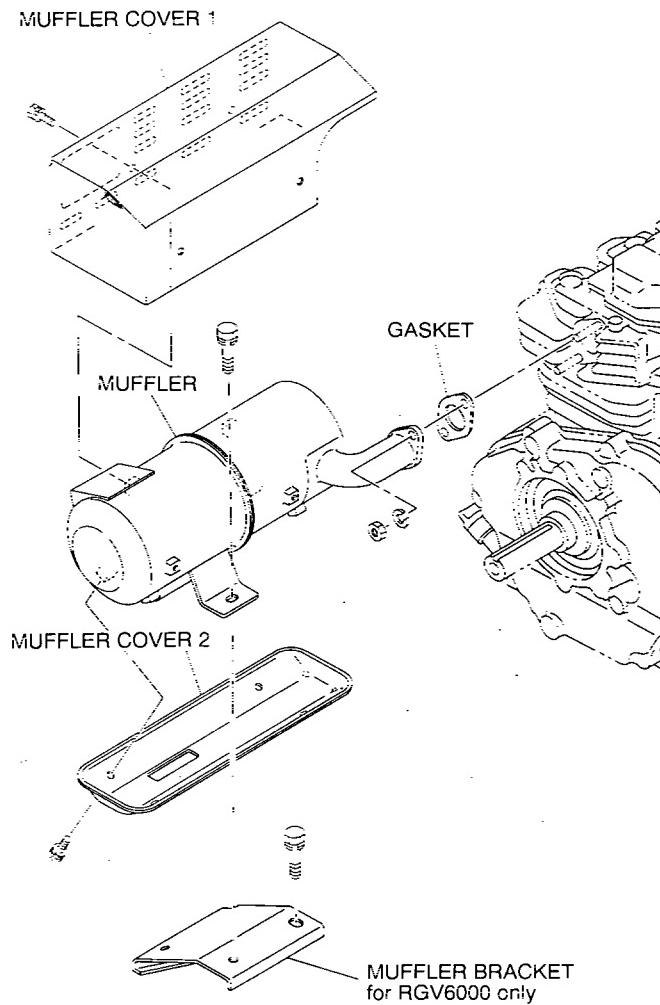


Fig. 10-35

(5) For RGV2200, RGV2600 and RGV4000 only :

Attach the rear plate to the frame.

M6×10mm bolt 2 pcs.

Tightening torque
40~60 kg·cm
3.9~5.9 N·m
2.9~4.3 ft·lbs

10-4-8 FUEL TANK

(1) For RGV2200, RGV2600 and RGV4000 only :

Attach the fuel strainer to the bottom of the fuel tank.
Screw in the fuel strainer all the way and return one to two turns, and then lock it with the lock nut.

For RGV6000 only :

Attach the fuel strainer to the frame.

Tightening torque
50~70 kg·cm
4.9~6.9 N·m
3.6~5.0 ft·lbs

(2) Mount the fuel tank on the frame with rubber washers between the tank flange and the frame.

M6×20mm bolt (black) 4 pcs.
Rubber washer 4 pcs.

NOTE : For easy tank assembly, glue the rubber washers over the mounting holes of the frame.

(3) Connect the rubber pipe.

First, fit the hose clamps on the rubber pipe and connect it to the strainer and the carburetor. Then fasten it with the hose clamps.

For RGV6000, connect the rubber pipe to the strainer and the fuel tank in the same way.

NOTE : Apply a drop of oil to the rubber pipe for easier connection.

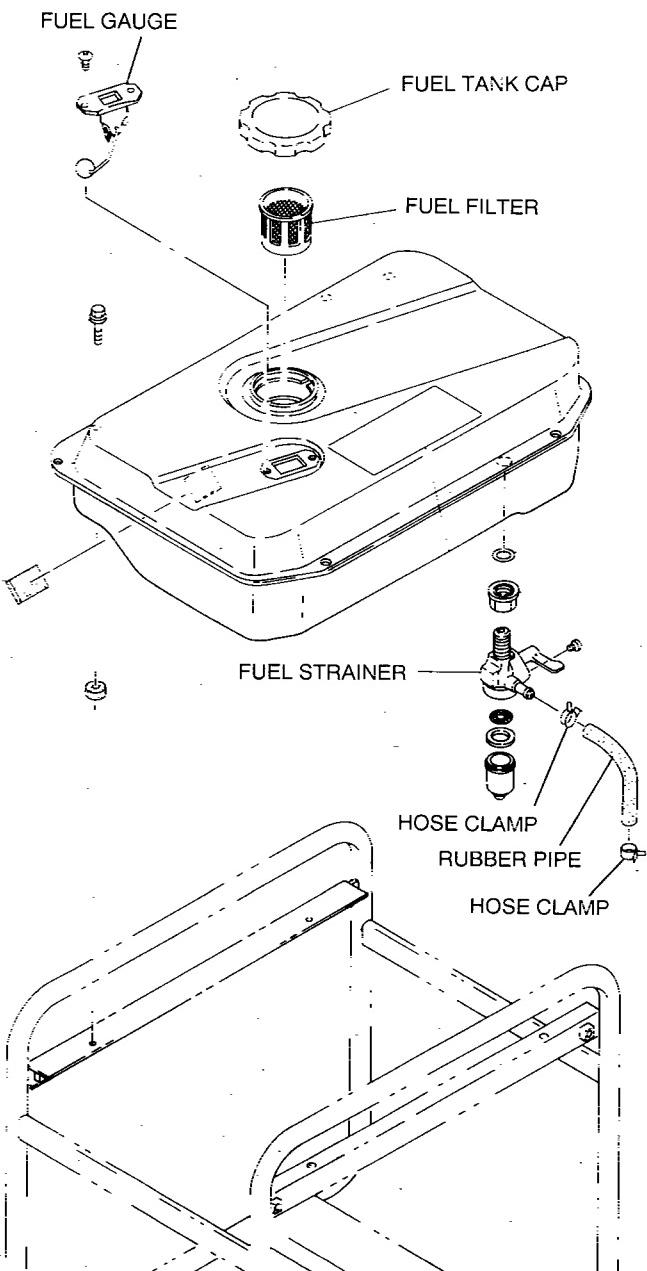


Fig. 10-36

10-4-9 FRONT PANEL

Mount the front panel assembly to the frame.

Refer to Section 10-5 for disassembly, checking and reassembly procedures of the front panel.

- (1) Connect the wires from the front panel and the engine.
 - (2) Connect the wires drawn out from the stator to the wires from the front panel.
- NOTE : Connect the wires of the same color.*
- (3) Press the upper end of the bushing into the bottom window of the front panel.
 - (4) Mount the front panel to the frame.

M6 × 12 mm flange bolt 4 pcs.

Tightening torque
40~60 kg·cm
3.9~5.9 N·m
2.9~4.3 ft·lbs

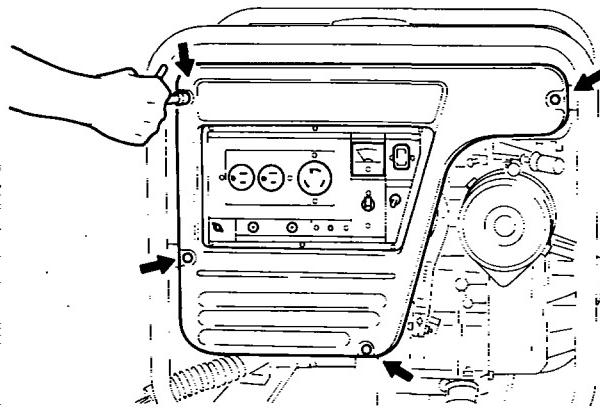


Fig. 10-37

10-5 CHECKING, DISASSEMBLY and REASSEMBLY of the FRONT PANEL

10-5-1 CHECKING OF THE FRONT PANEL

Dismount the front panel from frame.

Remove the control panel and check each components and wiring.

Refer to Section 9 for the detail of checking procedure for the components in the front panel.

10-5-2 DISASSEMBLY

- (1) Remove the control panel from the front panel.

M4 screw 6 pcs. (RGV2200, RGV2600, RGV4000)

M4 screw 7 pcs. (RGV6000)

- (2) Disconnect the connectors on the wires to detach the control panel and front panel.

- (3) Remove the condensers and diode rectifier from the front panel.

- (4) After disconnecting individual wires, remove the control panel components.

NOTE : Full power switch and pilot lamp have their wires soldered. Unsolder them to remove those parts if necessary.

10-5-3 REASSEMBLY

- (1) Install the receptacles, no-fuse breaker, terminals, switches, etc. on the control panel and wire them.

NOTE : Circuit diagrams are shown in Section 12. Colored wires are used for easy identification, and are of the correct capacity and size. Use heat-resistant type wires (permissible temperature range 75°C or over) in the specified gauge shown in the circuit diagrams.

- (2) Install condensers, and diode rectifier into the front panel.

- (3) Connect the wires of control panel components and front panel.

- (4) Attach the control panel to the front panel.

M4 screw 6 pcs. (RGV2200, RGV2600, RGV4000)

M4 screw 7 pcs. (RGV6000)

Tightening torque

12~15 kg·cm

1.2~1.5 N·m

8.7~10.9 ft·lbs

11. TROUBLESHOOTING

11-1 NO AC OUTPUT

11-1-1 CHECKING CONDENSER

Check the capacity of condensers using a "Dr. Robin" generator tester in capacitance meter mode.

NOTE : Be sure to discharge condensers by shorting condenser leads each other before checking their capacitance, or the accurate reading cannot be obtained.

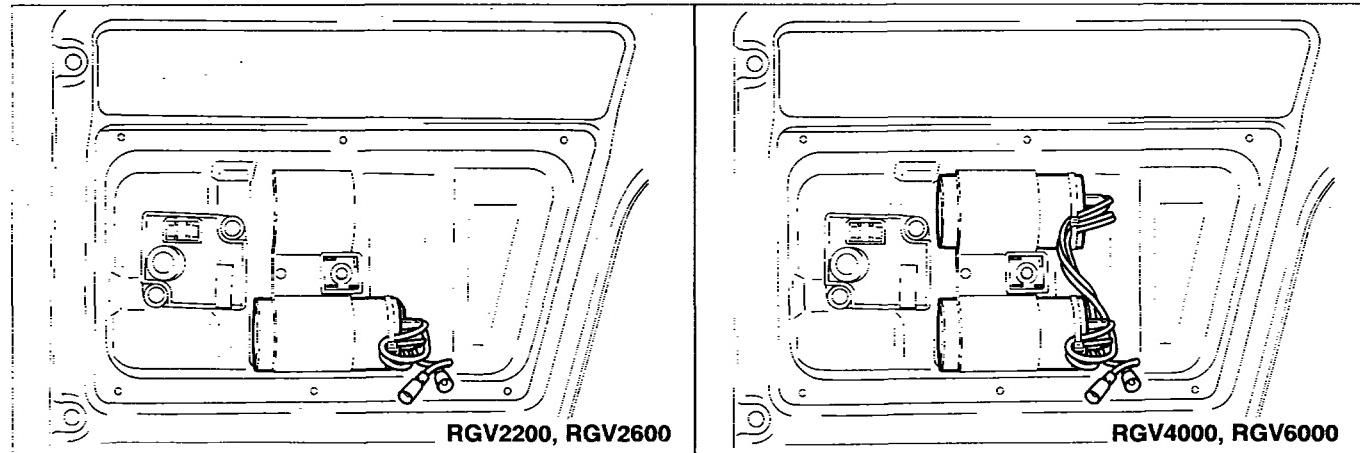


Fig. 11-1

■ NORMAL CAPACITY OF CONDENSER

MODEL	RGV2200	RGV2600	RGV4000	RGV6000
CAPACITY	17 μ F	24 μ F	20 μ F×2	28 μ F×2

Table 11-1

- If such an instrument is unavailable, the condenser can be checked by replacing with a new one. If the generator performs good with new condenser, the cause of trouble is defect in original condenser.

11-1-2 CHECKING STATOR

- Remove control panel and disconnect stator wires at the connectors.
- Measure the resistance between terminals on stator leads. (See Fig.11-2)
Refer to Table 9-1 for normal resistance.
If stator is faulty, replace it with a new one.

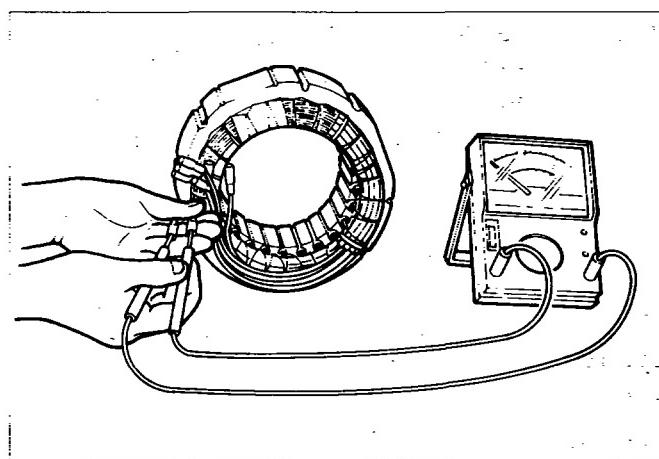


Fig. 11-2

- Check the insulation resistance between stator core and each stator lead using a Dr. Robin generator tester in megger tester mode or a megger tester. (Fig. 11-3)
If insulation is bad, replace stator with a new one.

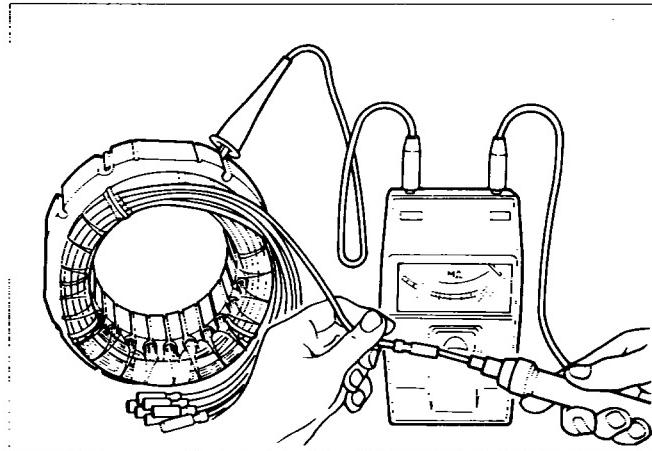


Fig. 11-3

11-1-3 CHECKING ROTOR

(1) CHECKING FIELD COIL

- Remove rear cover and stator.

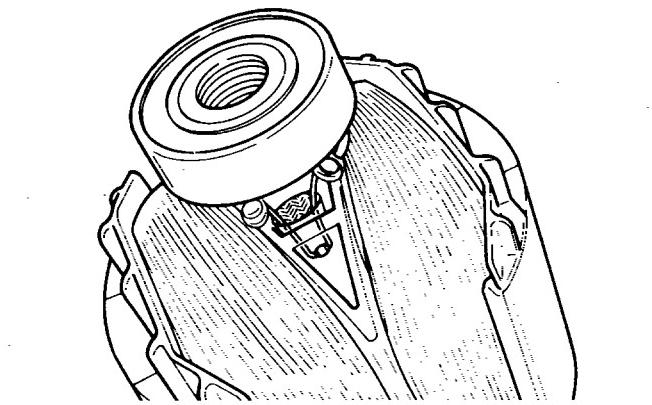


Fig. 11-4

- Using a Dr. Robin or a circuit tester, measure the resistance of the field coil at the terminals.

$(R \times 1\Omega \pm 10\%)$

MODEL	RGV2200	RGV2600	RGV4000	RGV6000
RESISTANCE	2.52 Ω	2.04 Ω	1.77 Ω	1.60 Ω

Table 11-2

NOTE 1 : Because a diode is soldered to the coil ends at the terminals, resistance may be measured only when tester probes touch the terminals in one combination of polarity. Therefore, if no resistance reading appears, try checking in reverse polarity.

[Remedy]

If the resistance is not normal, replace rotor with a new one.

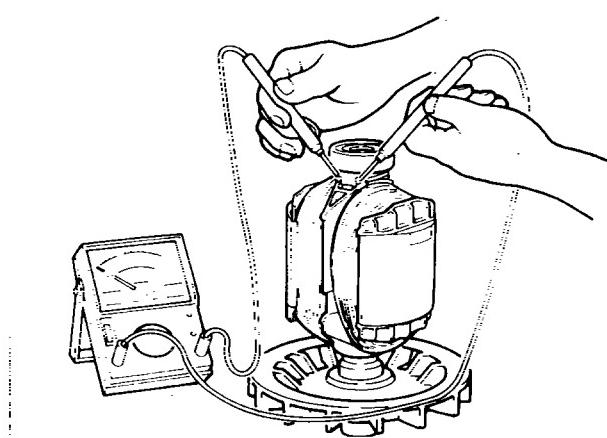


Fig. 11-5

- Measure the insulation across one of the soldered terminals of the rotor and the core. (Fig.11-6)

If insulation is bad, replace rotor with a new one.

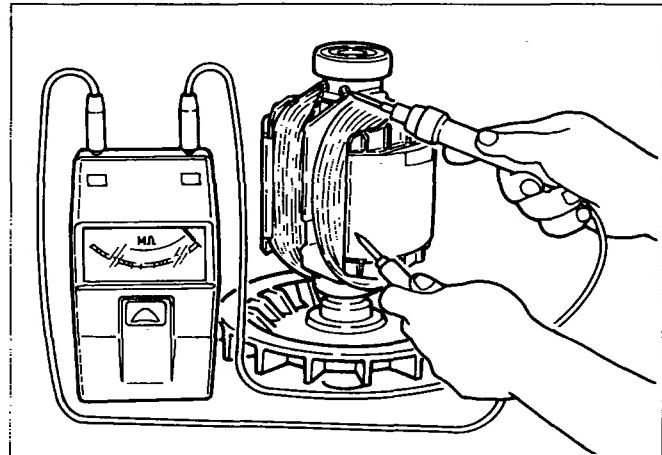


Fig. 11-6

11-2 AC VOLTAGE IS TOO HIGH OR TOO LOW

11-2-1 CHECKING ENGINE SPEED

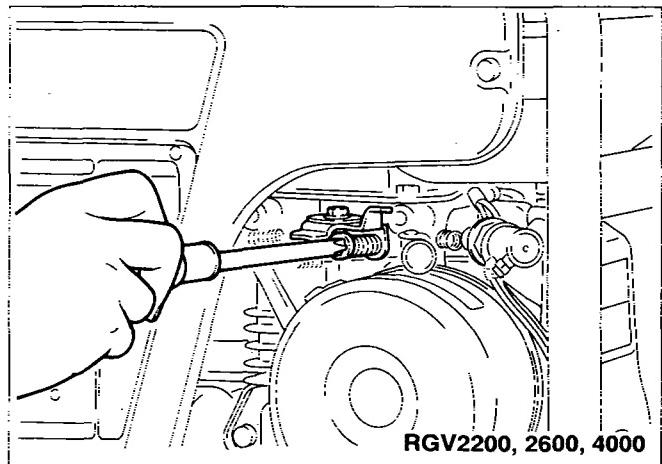
If the engine speed is too high or too low, adjust it to the rated r.p.m.

[How to adjust engine r.p.m.]

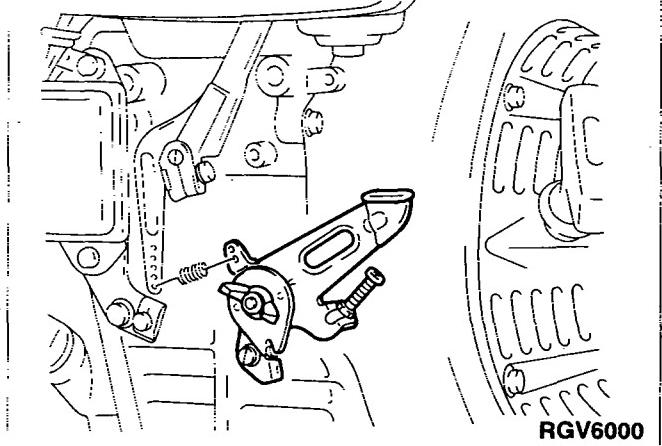
- Loosen the lock nut on the adjusting screw.
- Turn the adjusting screw clockwise to decrease engine speed or counter-clockwise to increase engine speed.

Normal engine speed at no load is :

3100 ~ 3150 r.p.m. for 50Hz type
3700 ~ 3750 r.p.m. for 60Hz type



RGV2200, 2600, 4000



RGV6000

11-2-2 CHECKING CONDENSER

Check condenser referring to Step 11-1-1.

11-2-3 CHECKING STATOR

Check stator referring to Step 11-1-2.

11-2-4 CHECKING ROTOR

Check rotor referring to Step 11-1-3.

Fig. 11-7

11-3 AC VOLTAGE IS NORMAL AT NO-LOAD, BUT THE LOAD CANNOT BE APPLIED.

11-3-1 CHECK THE ENGINE SPEED.

If the engine speed is low, adjust it to the rated r.p.m.

* Refer to Step 11-2-1 for engine speed adjustment.

11-3-2 CHECK THE TOTAL WATTAGE OF APPLIANCES CONNECTED TO THE GENERATOR.

Refer to Section 7 "RANGE OF APPLICATIONS" for the wattage of the appliances.

If the generator is over-loaded, reduce the load to the rated output of the generator.

11-3-3 CHECK THE APPLIANCE FOR TROUBLE.

If the appliance is faulty, repair it.

11-3-4 CHECK IF THE ENGINE IS OVERHEATED.

If the cooling air inlet and/or cooling air outlet is clogged with dirt, grass, chaff or other debris, remove it.

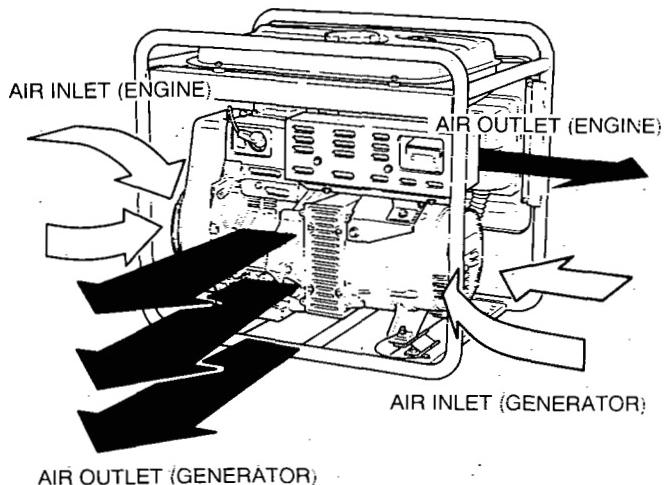


Fig. 11-8

11-3-5 CHECK THE INSULATION OF THE GENERATOR.

Stop the engine. Measure the insulation resistance between the live terminal of the receptacle and the ground terminal.

If the insulation resistance is less than $1\text{ M}\Omega$, disassemble the generator and check the insulation resistance of the stator, rotor and the live parts in the control box. (Refer to Section 8-3.)

Any part where the insulation resistance is less than $1\text{ M}\Omega$, the insulation is faulty and may cause electric leakage.

Replace the faulty part.

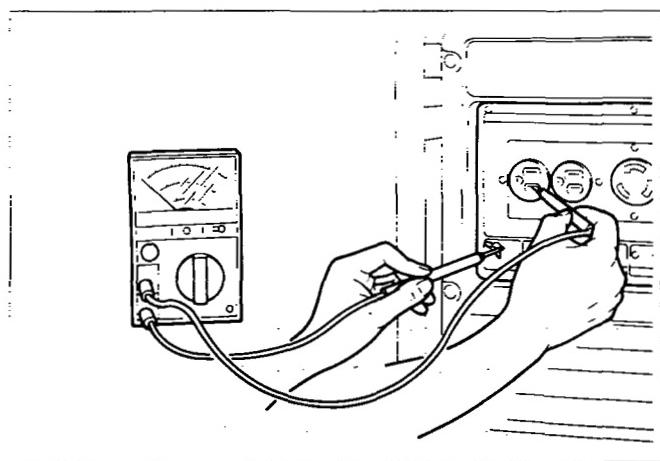


Fig. 11-9

11-4 NO DC OUTPUT

11-4-1 CHECK THE AC OUTPUT.

Check the generator by following Step 11-1-1 through Step 11-1-3.

11-4-2 CHECK THE DC BREAKER.

If the DC breaker turned off while charging a battery, check the cables for short-circuit or connection in reverse polarity before resetting it on.

NOTE : If the DC output is used to charge a large capacity battery or an over-discharged battery, an excessive current may flow causing.

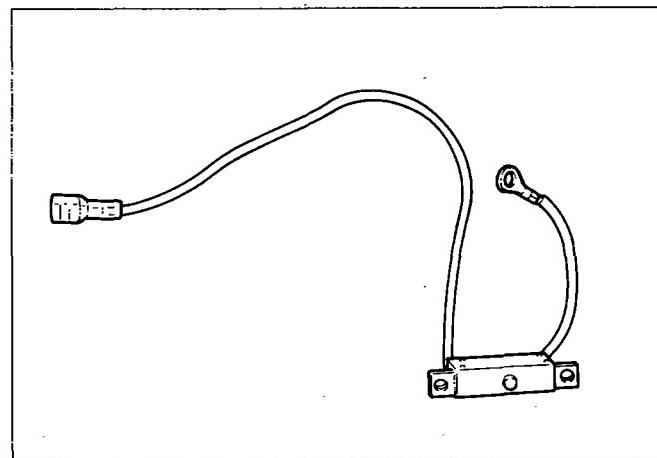


Fig. 11-10

11-4-3 CHECK THE WIRING.

Check all the wires to be connected correctly.

11-4-4 CHECK THE DIODE RECTIFIER.

Remove the control panel and check the diode rectifier with a circuit tester.

Refer to Section 9-7 "DIODE RECTIFIER" for the checking procedure.

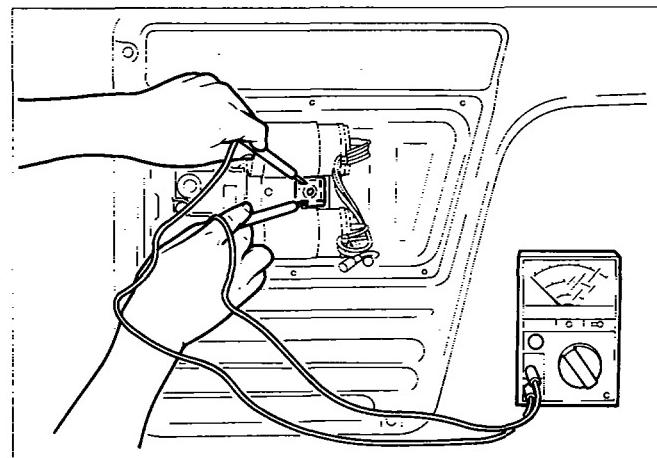


Fig. 11-11

11-4-5 CHECK THE DC COIL

Check the resistance between two brown leads from stator with a circuit tester.

MODEL	SPECIFICATION		RESISTANCE
RGV2200	50Hz	110V, 220V, 240V, 110V/220V	0.36Ω
	60Hz	120V, 220V, 110V/220V, 120V/240V	0.32Ω
RGV2600	50Hz	110V, 220V, 240V, 110V/220V	0.26Ω
	60Hz	120V, 220V, 110V/220V, 120V/240V	0.21Ω
RGV4000	50Hz	110V, 220V, 240V, 110V/220V	0.24Ω
	60Hz	120V, 220V, 110V/220V, 120V/240V	0.20Ω
RGV6000	50Hz	110V, 220V, 240V, 110V/220V	0.15Ω
	60Hz	120V, 220V, 110V/220V, 120V/240V	0.13Ω

Table 11-3

If the resistance reading is much larger or smaller than the specified value, the DC coil of the stator is faulty. Replace stator with a new one.

11-5 IDLE CONTROL (OPTIONAL EQUIPMENT)

11-5-1 ENGINE SPEED IS NOT INCREASED WHEN A LOAD IS APPLIED

(1) Inspect the solenoid bracket.

Check the bend angle of solenoid bracket.

If the bracket is distorted, correct the angle with proper tool.

(2) Check the wattage of load applied to the generator.

If the generator is loaded over the rated wattage, the engine speed can not be increased. Most induction loads such as electric motor or electric tools or welding machine require three to five times large wattage of their ratings at starting.

This starting wattage must not exceed the rated output of the generator.

(3) Check the slow set r.p.m.

The normal idling speed by the IDLE CONTROL is as follows :

RGV2200, 2600 1900 ~ 2100 r.p.m.

RGV4000, 6000 2000 ~ 2200 r.p.m.

The above speed setting is for cold engine condition.

If the engine speed is out of adjusting range of the adjusting screw, move the solenoid backward.

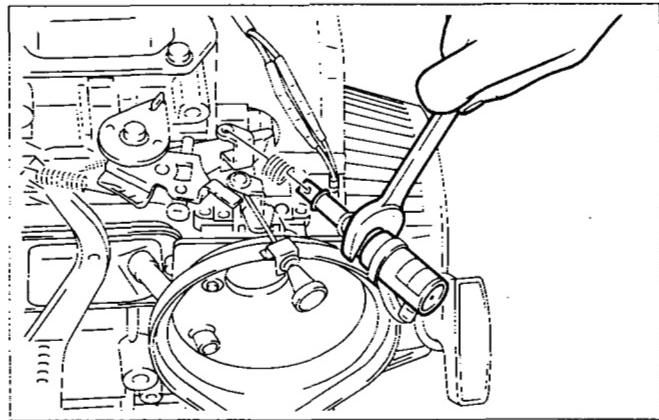


Fig. 11-12

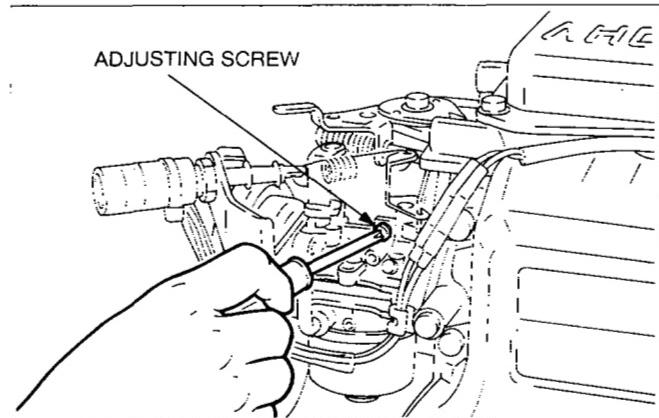


Fig. 11-13

(4) Check the wiring through ZCT on the IDLE CONTROL UNIT.

A) Single Voltage Type

Make sure that an output wire from main coil is passing through the ZCT on the IDLE CONTROL UNIT.

B) Dual Voltage Type

Check that two output wires (black wire and red wire) from main coils are passing through the ZCT on the IDLE CONTROL UNIT in the same direction.

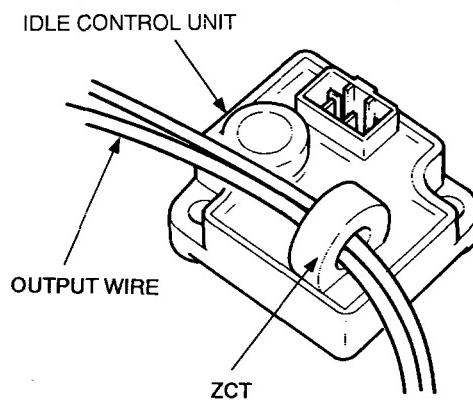
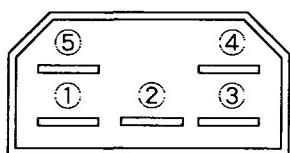


Fig. 11-14

(5) Checking the IDLE CONTROL UNIT

Check the resistance between six leads of IDLE CONTROL UNIT with circuit tester.



Terminal number of the IDLE CONTROL UNIT

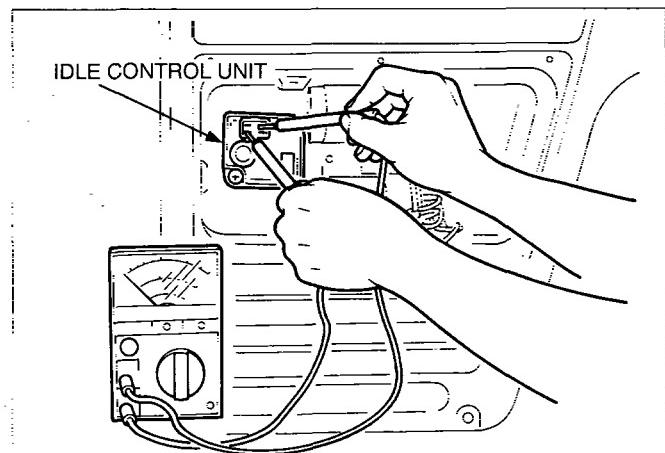


Fig. 11-15

Circuit tester (with battery power source 1.5V)		Apply black \ominus needle of the circuit tester				
		①	②	③	④	⑤
Apply red \oplus needle of the circuit tester	①	∞	250 k Ω	250 k Ω	75 k Ω	
	②	250 k Ω	∞	∞	∞	∞
	③	250 k Ω	∞	∞	250 k Ω	75 k Ω
	④	250 k Ω	∞	250 k Ω	∞	75 k Ω
	⑤	8.5 k Ω	∞	7.8 k Ω	7.8 k Ω	

* Tester measuring range : 1000 k Ω

Table 11-4

NOTE : The resistance readings vary depending on the types of circuit testers.

The above table shows an example of the resistance readings measured by an ordinary analogue circuit tester with 1.5 volt battery power source.

It is advisable for you to check the resistance readings using your standard circuit tester and revise the checking table.

11-5-2 ENGINE SPEED IS NOT REDUCED WHEN LOAD IS OFF.

- (1) Check the distortion of the SOLENOID BRACKET as shown in step 11-5-1-(1).
- (2) Check the wiring of SOLENOID.
Check two leads from SOLENOID are securely connected.
- (3) Check the wiring of IDLE CONTROL UNIT.
Check all leads from IDLE CONTROL UNIT are securely and correctly connected.
- (4) Checking the SOLENOID.
Measure the resistance between two leads from SOLENOID.

NORMAL RESISTANCE
25 ~ 31 Ω

If the resistance is larger or smaller than this range, SOLENOID is defective,
Replace with a new one.

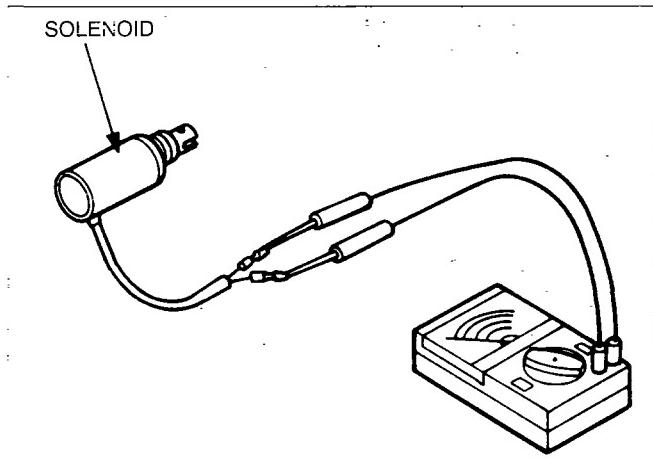
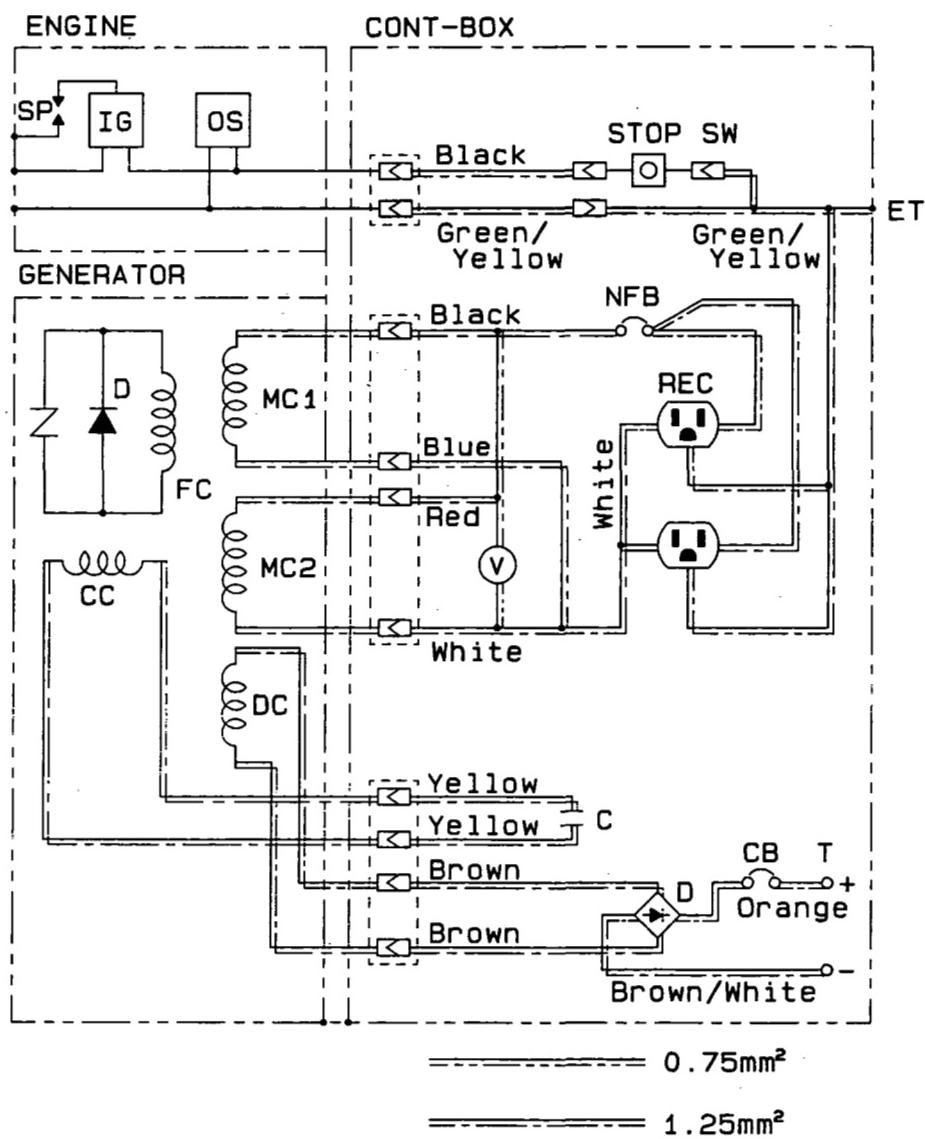


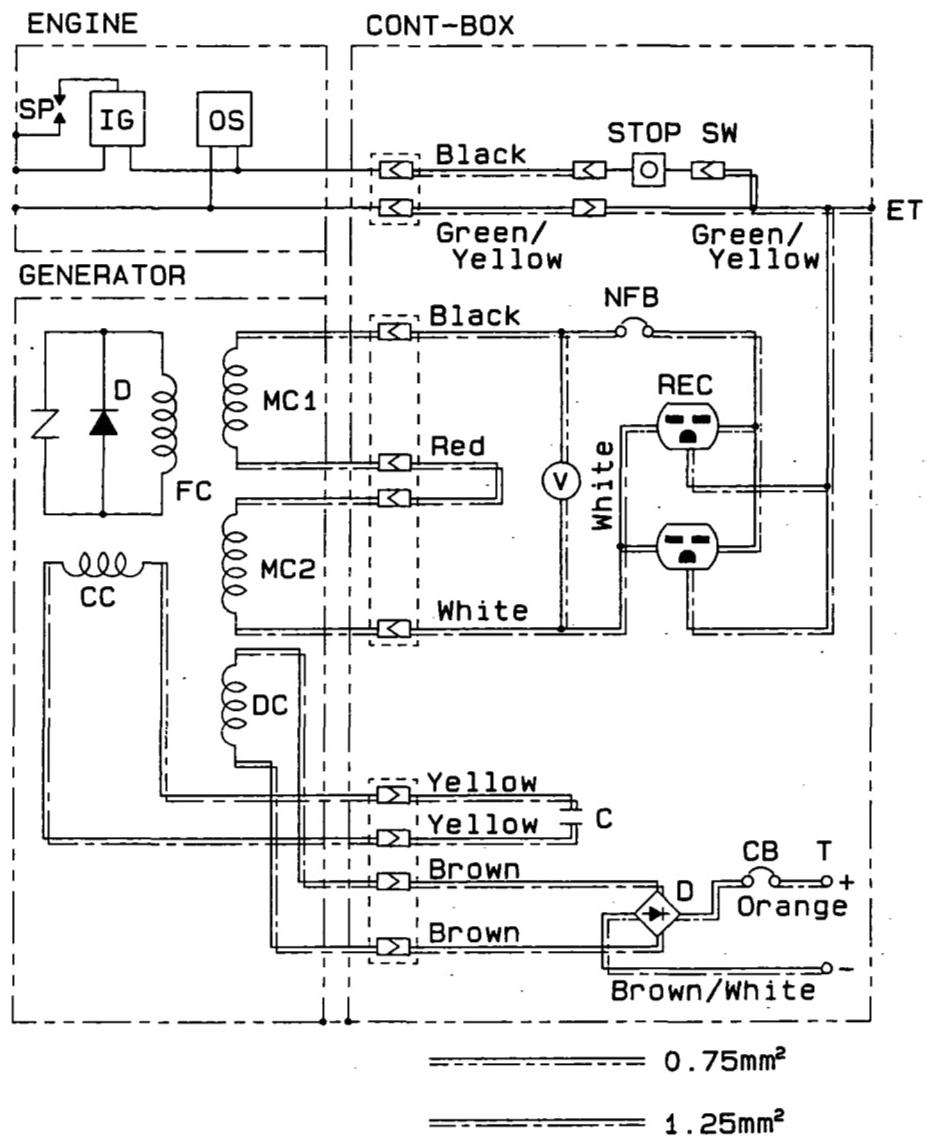
Fig. 11-17

12. WIRING DIAGRAM

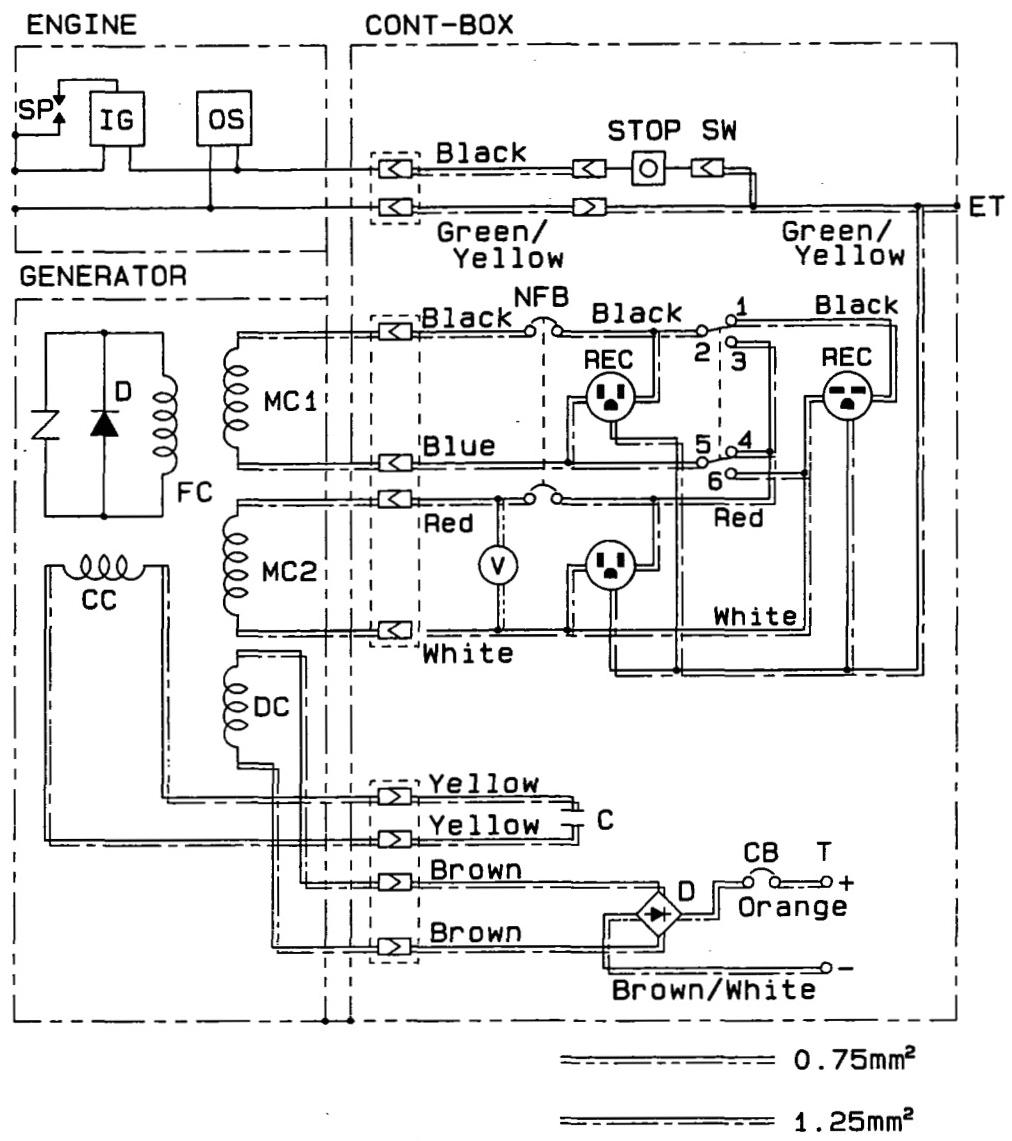
- RGV2200, 2600 : 50Hz-110V, 60Hz-110V, 60Hz-120V TYPE



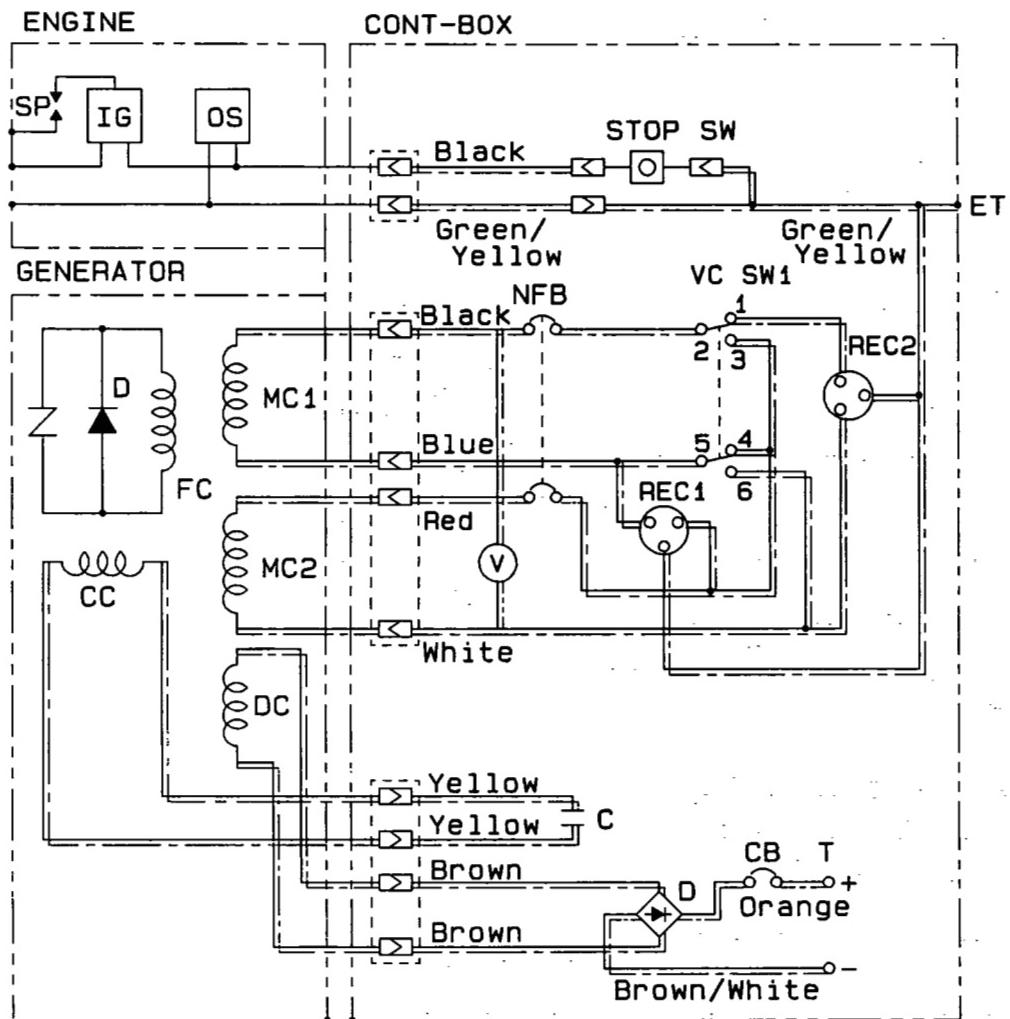
● RGV2200, 2600 : 50Hz-220V, 240V, 60Hz-220V TYPE



● RGV2200, 2600 : 50Hz, 60Hz-110V/220V TYPE

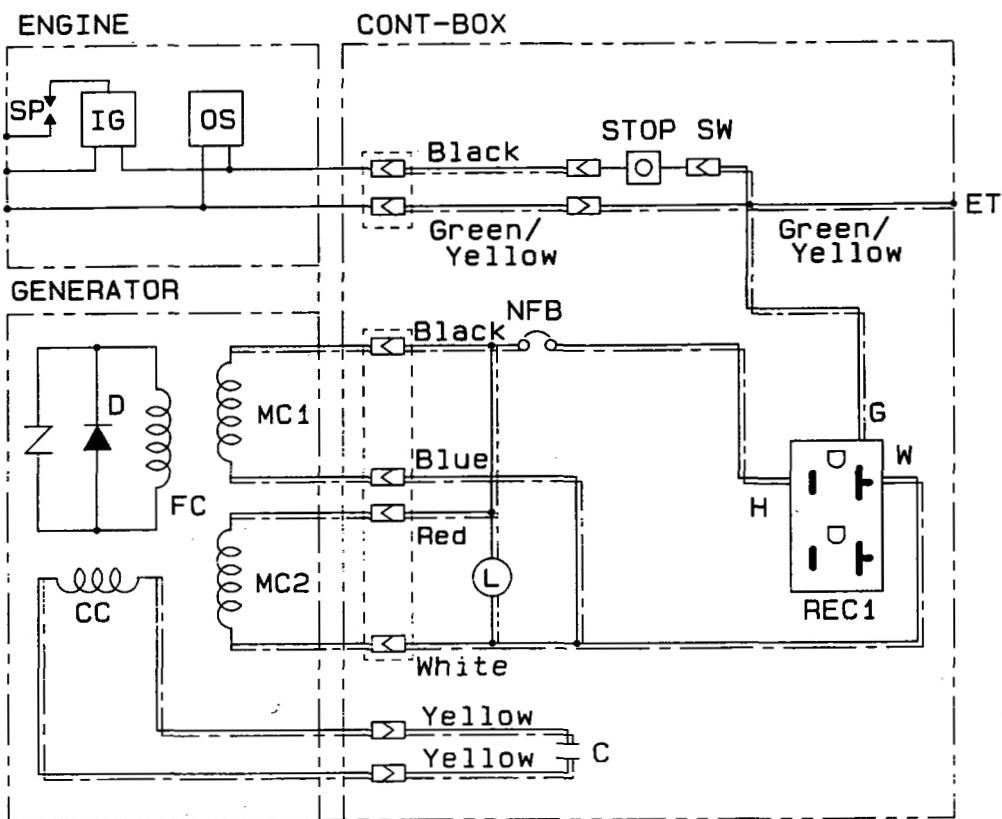


● RGV2200, 2600 : U.K., 50Hz-110V/220V [BS RECEPTACLE]



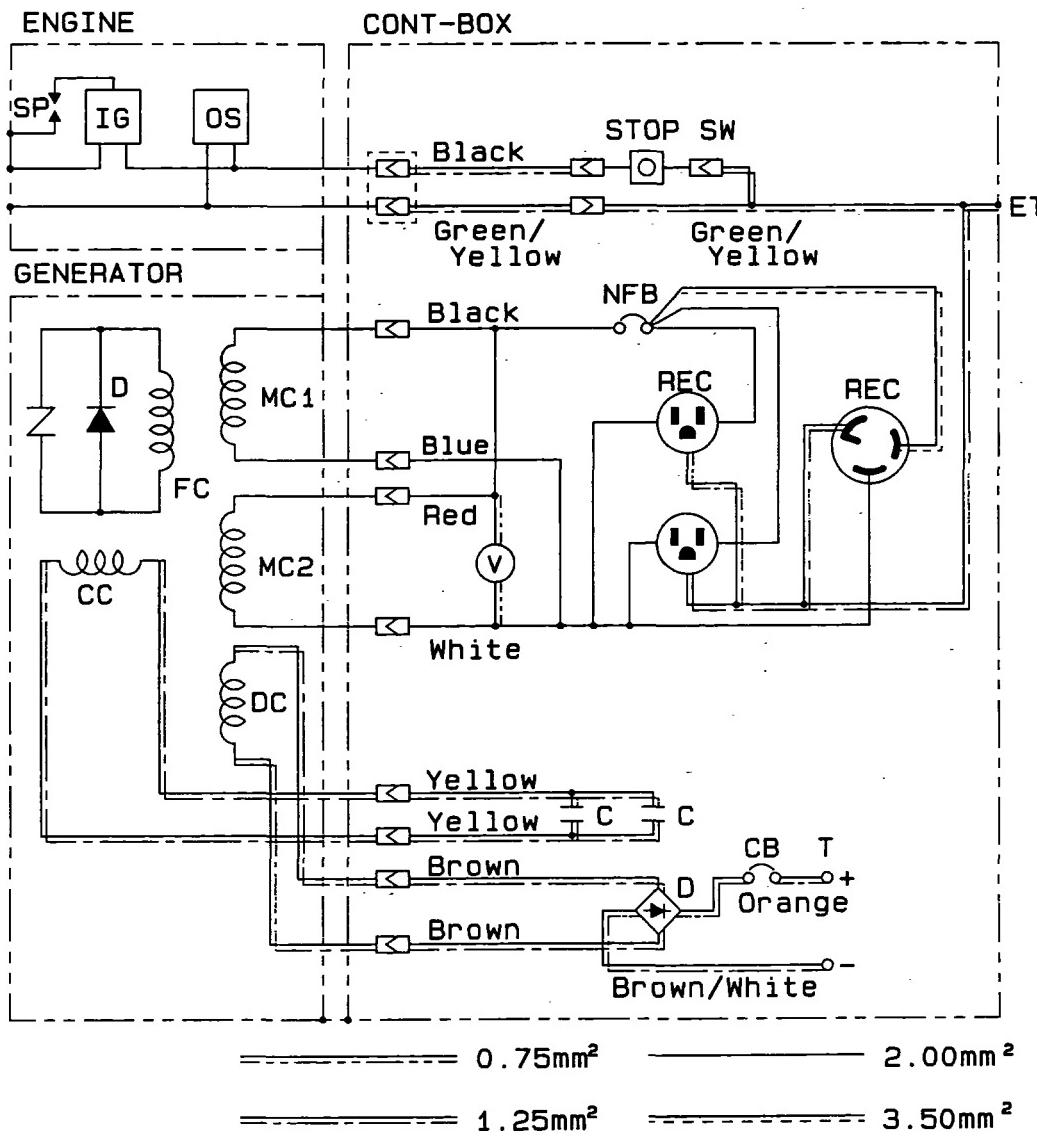
0.75mm² 2.00mm²
 1.25mm²

● RGV2600 : U.S.A., 60Hz-120V [NEMA RECEPTACLE]

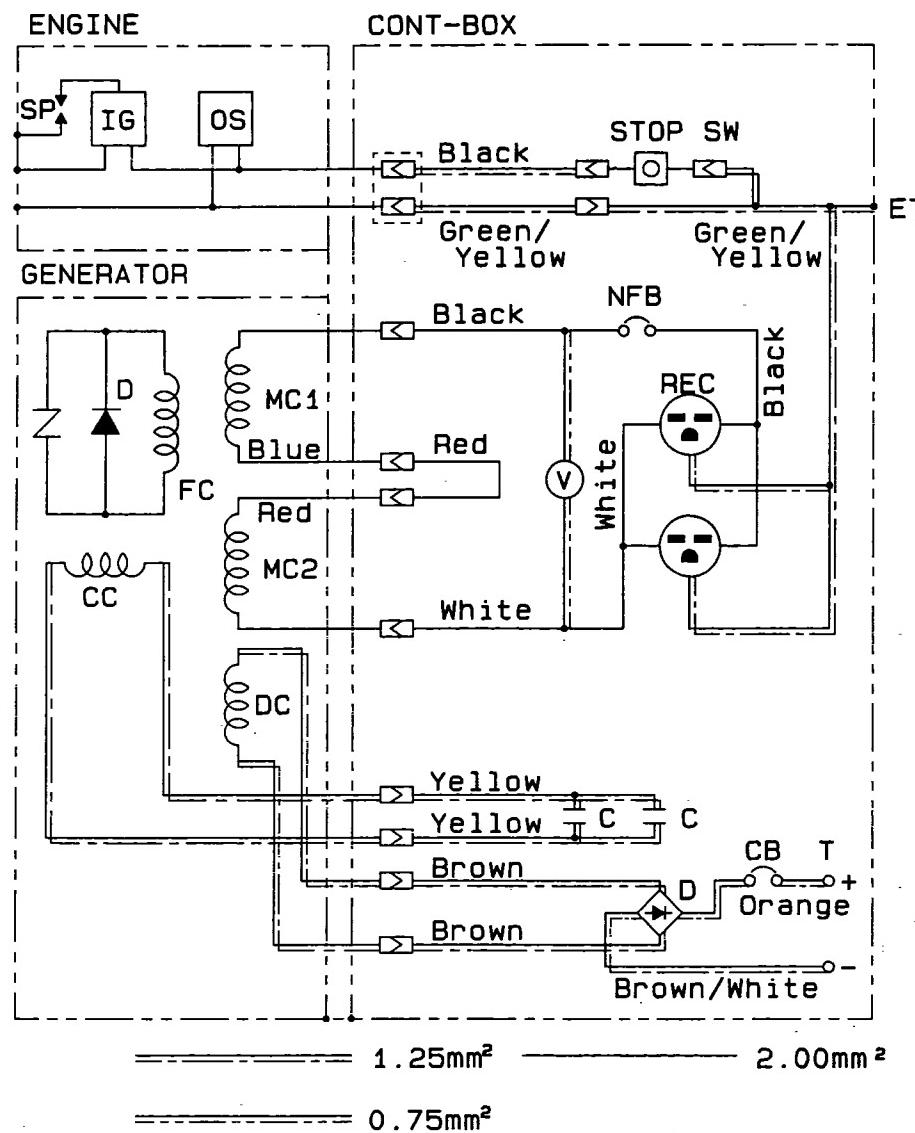


— 0.75mm² ————— 2.00mm²
— 1.25mm² —————

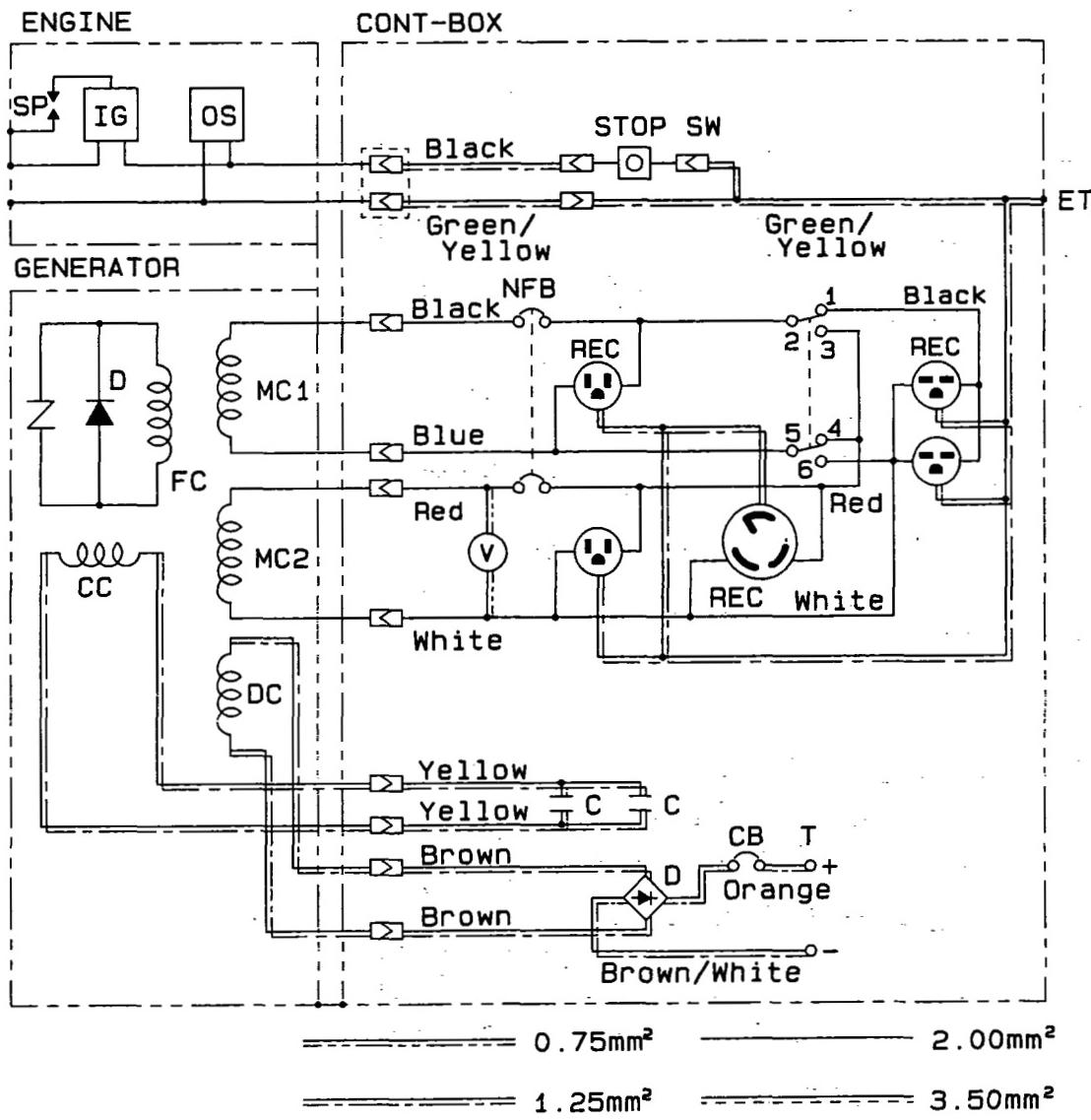
● RGV4000 : 50Hz-110V, 60Hz-110V, 60Hz-120V TYPE



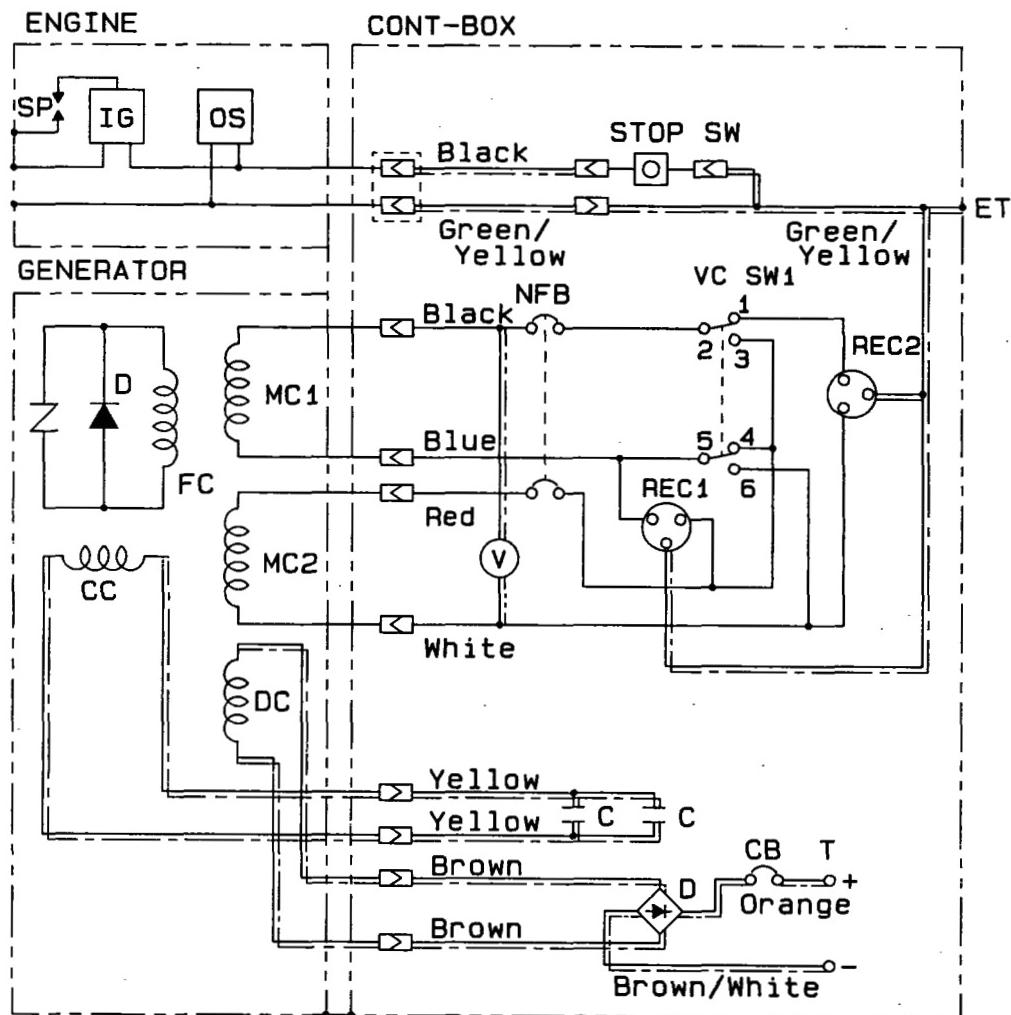
● RGV4000 : 50Hz-220V, 240V, 60Hz-220V TYPE



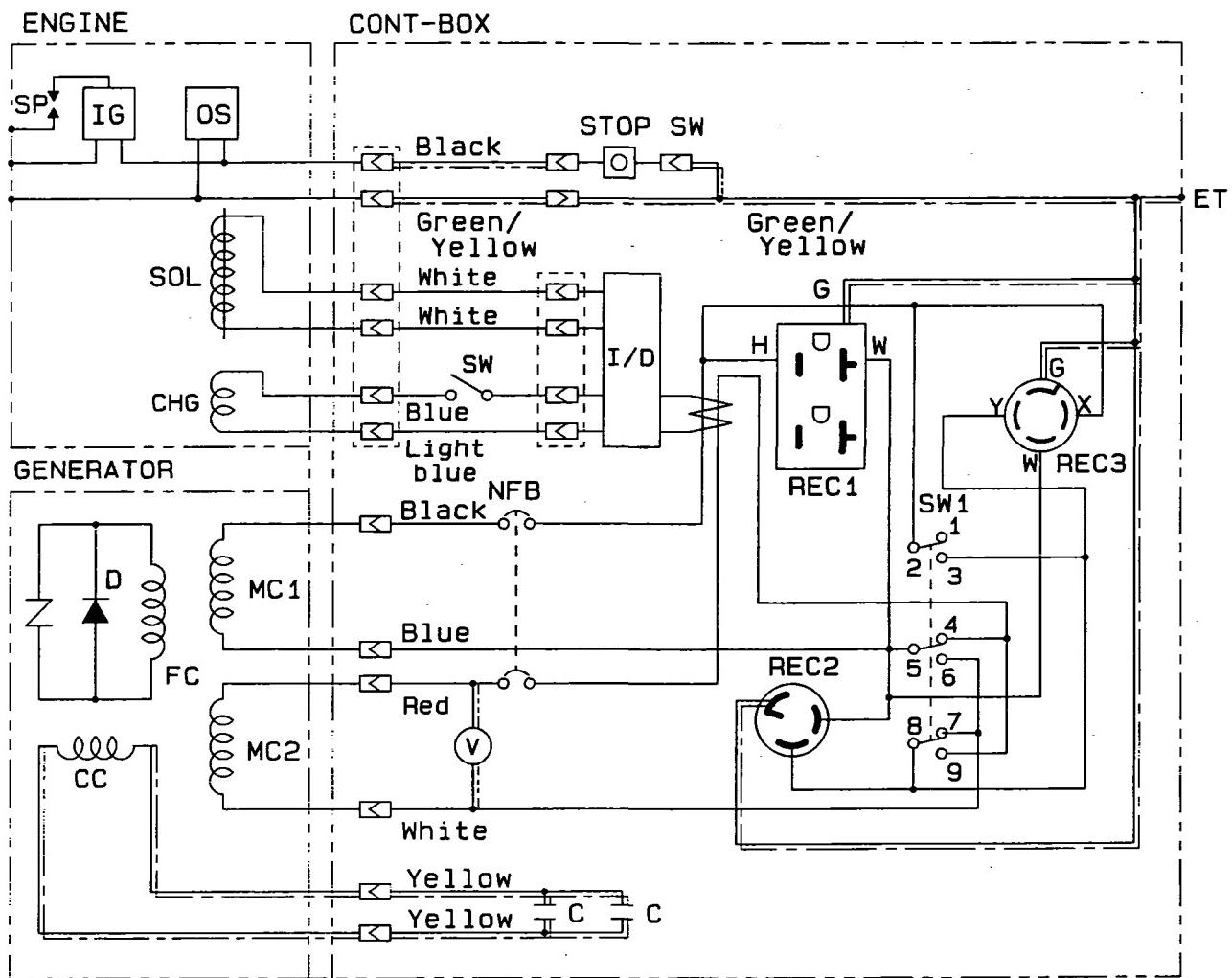
● RGV4000 : 50Hz, 60Hz-110V/220V TYPE



● RGV4000 : U.K., 50Hz-110V/220V [BS RECEPTACLE]

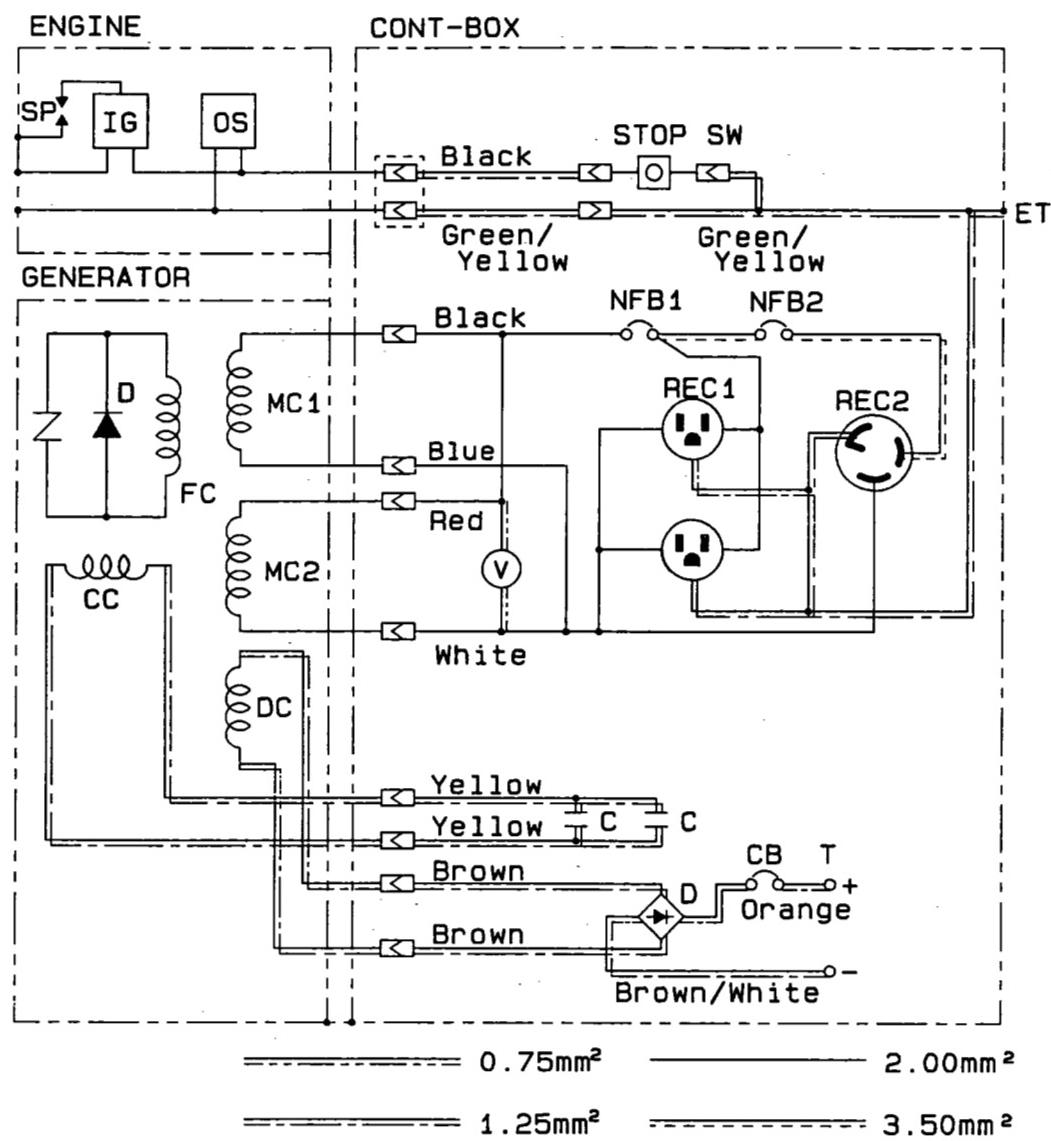


● RGV4000 : U.S.A., 60Hz-120V/240V [NEMA RECEPTACLE with IDLE CONTROL]

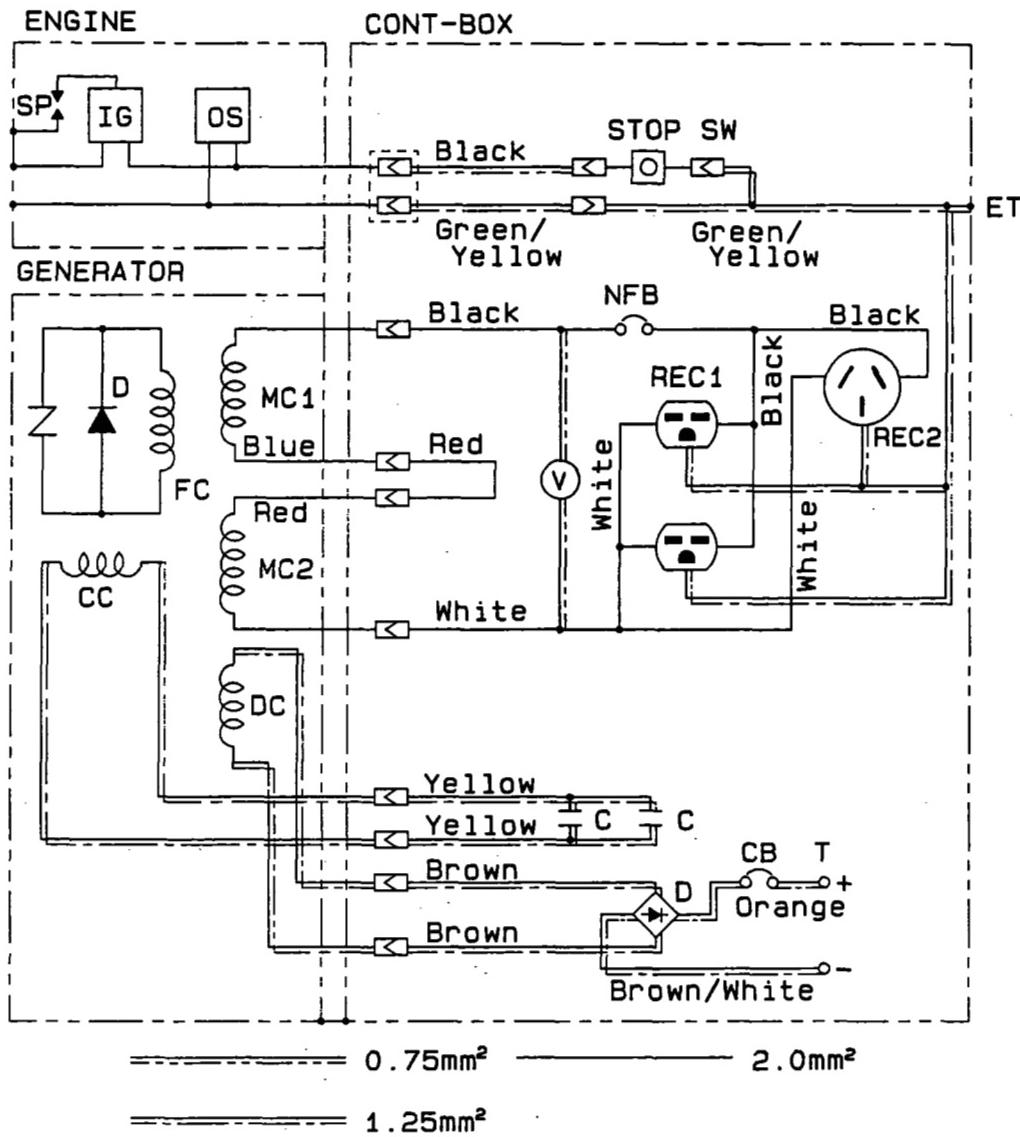


— 0.75mm² — 2.00mm²
— 1.25mm² —

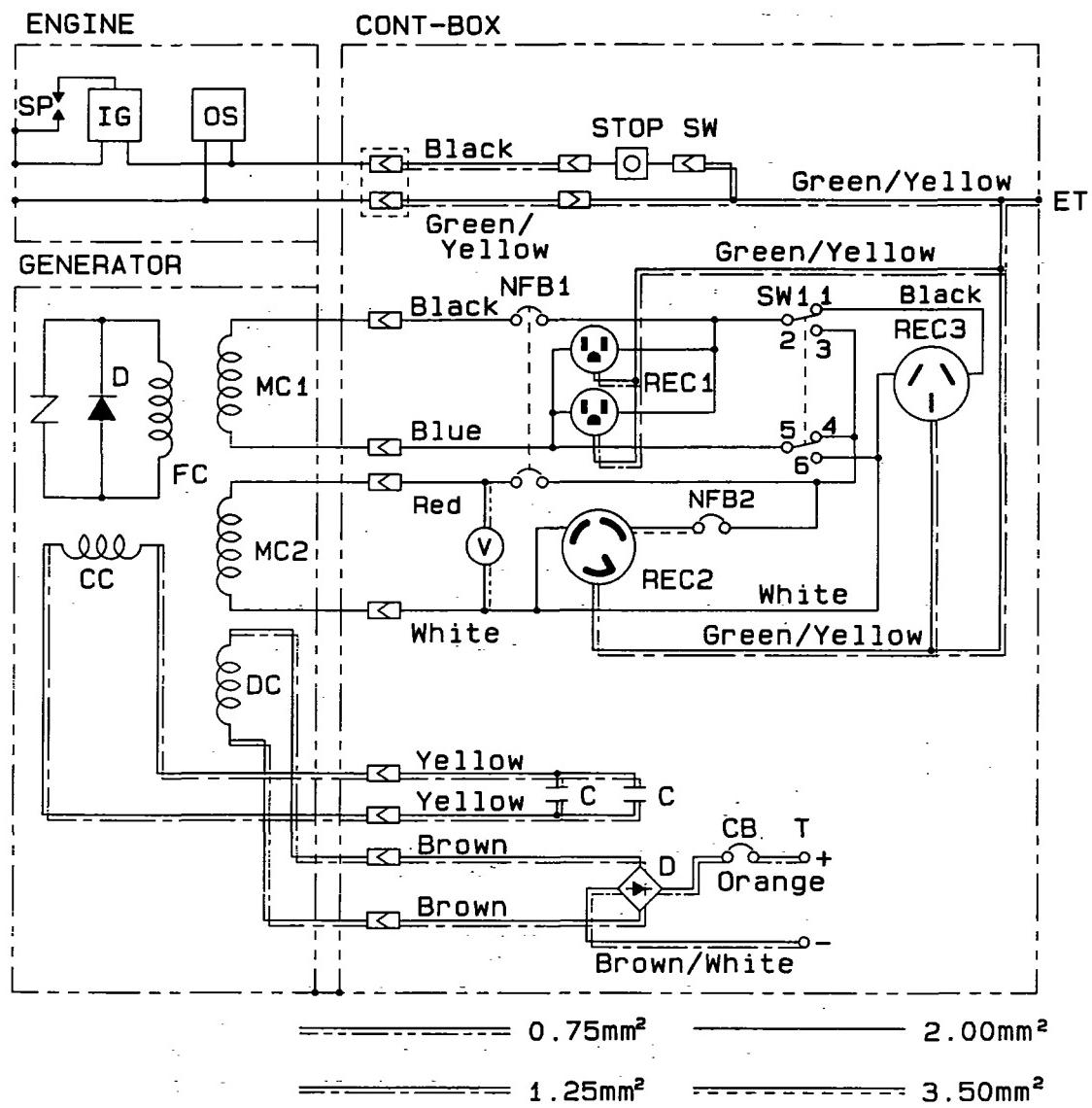
● RGV6000 : 50Hz-110V, 60Hz-110V, 60Hz-120V TYPE



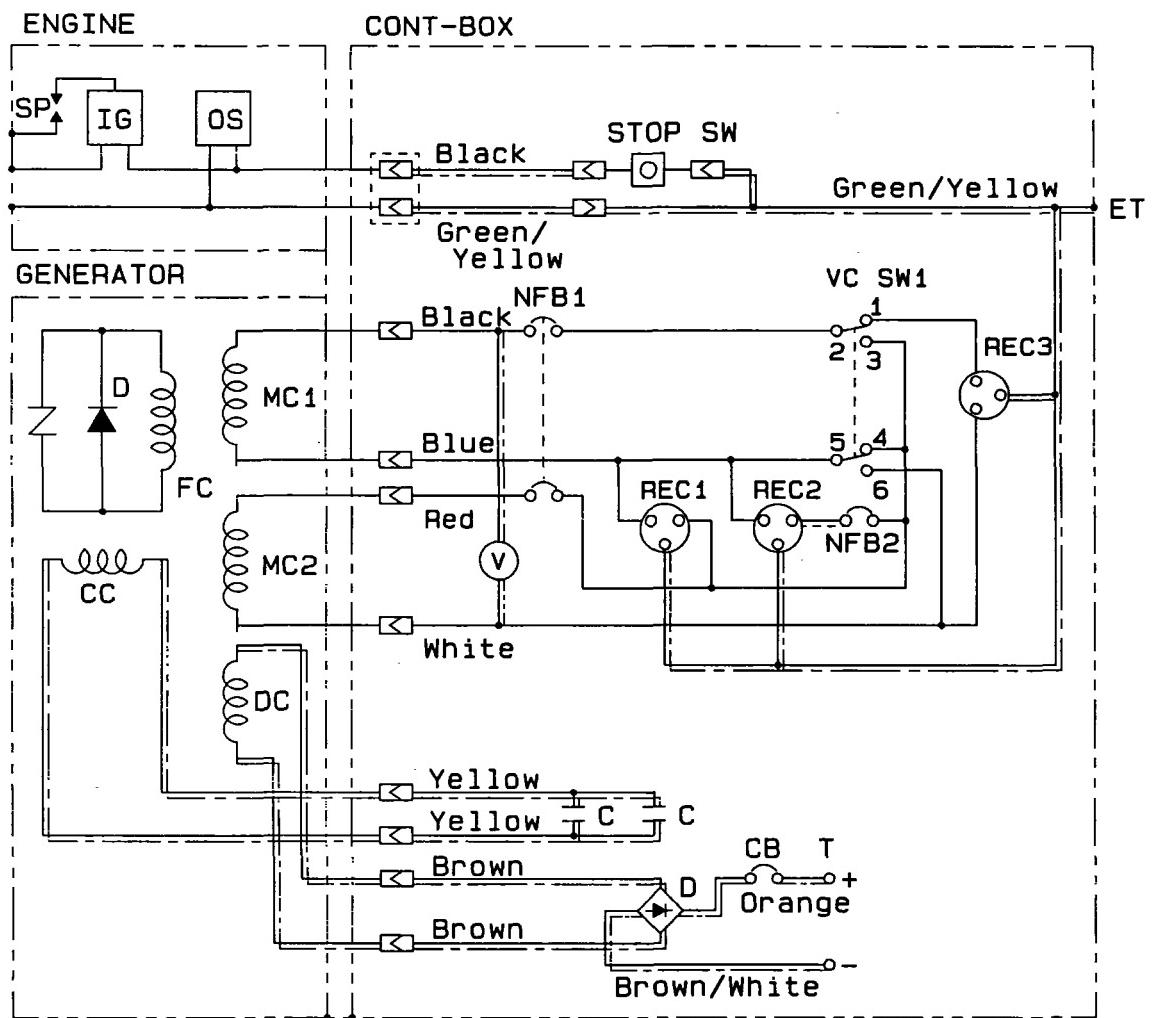
● RGV6000 : 50Hz-220V, 240V, 60Hz-220V TYPE



● RGV6000 : 50Hz, 60Hz-110V/220V TYPE

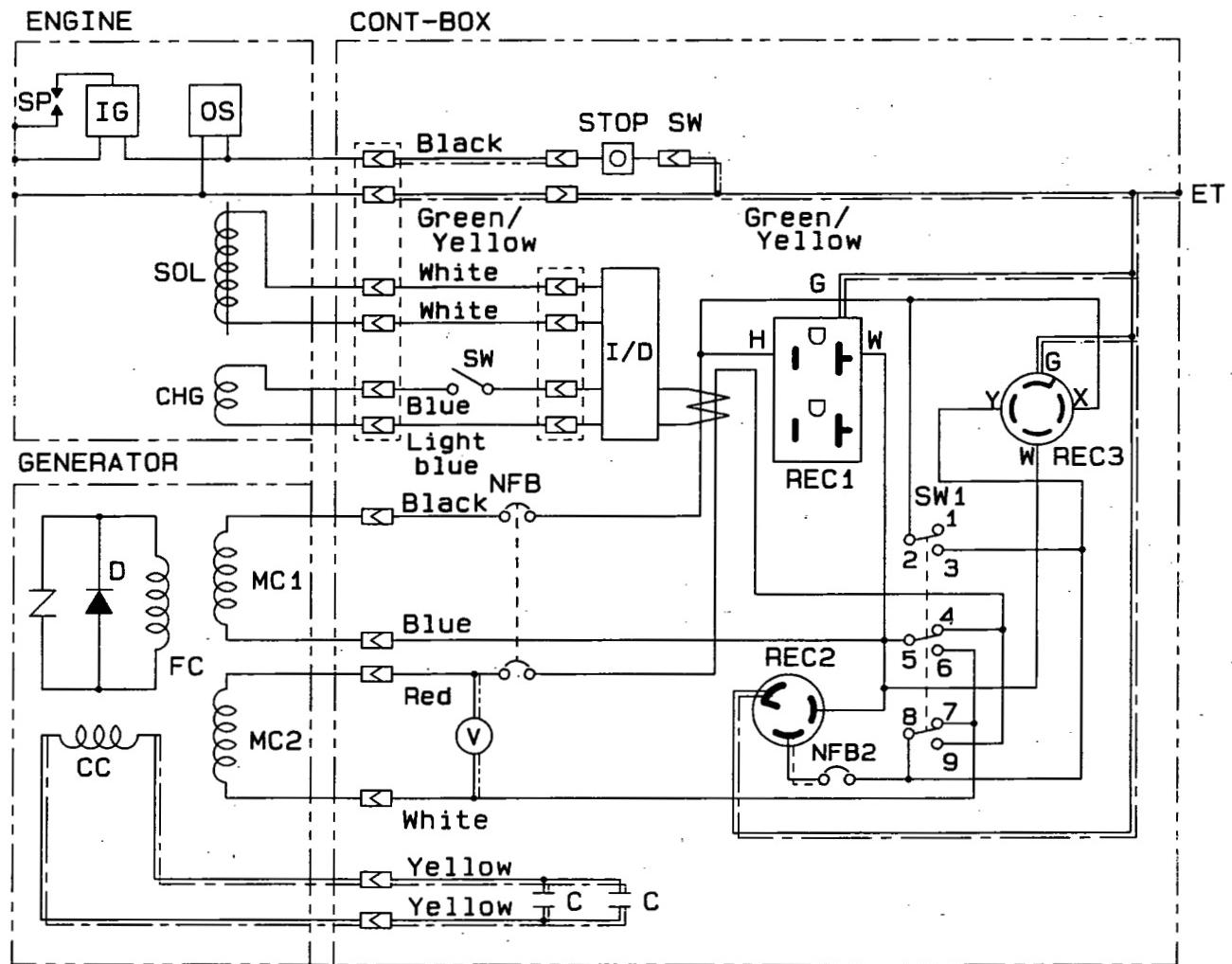


● RGV6000 : U.K., 50Hz-110V/220V [BS RECEPTACLE]



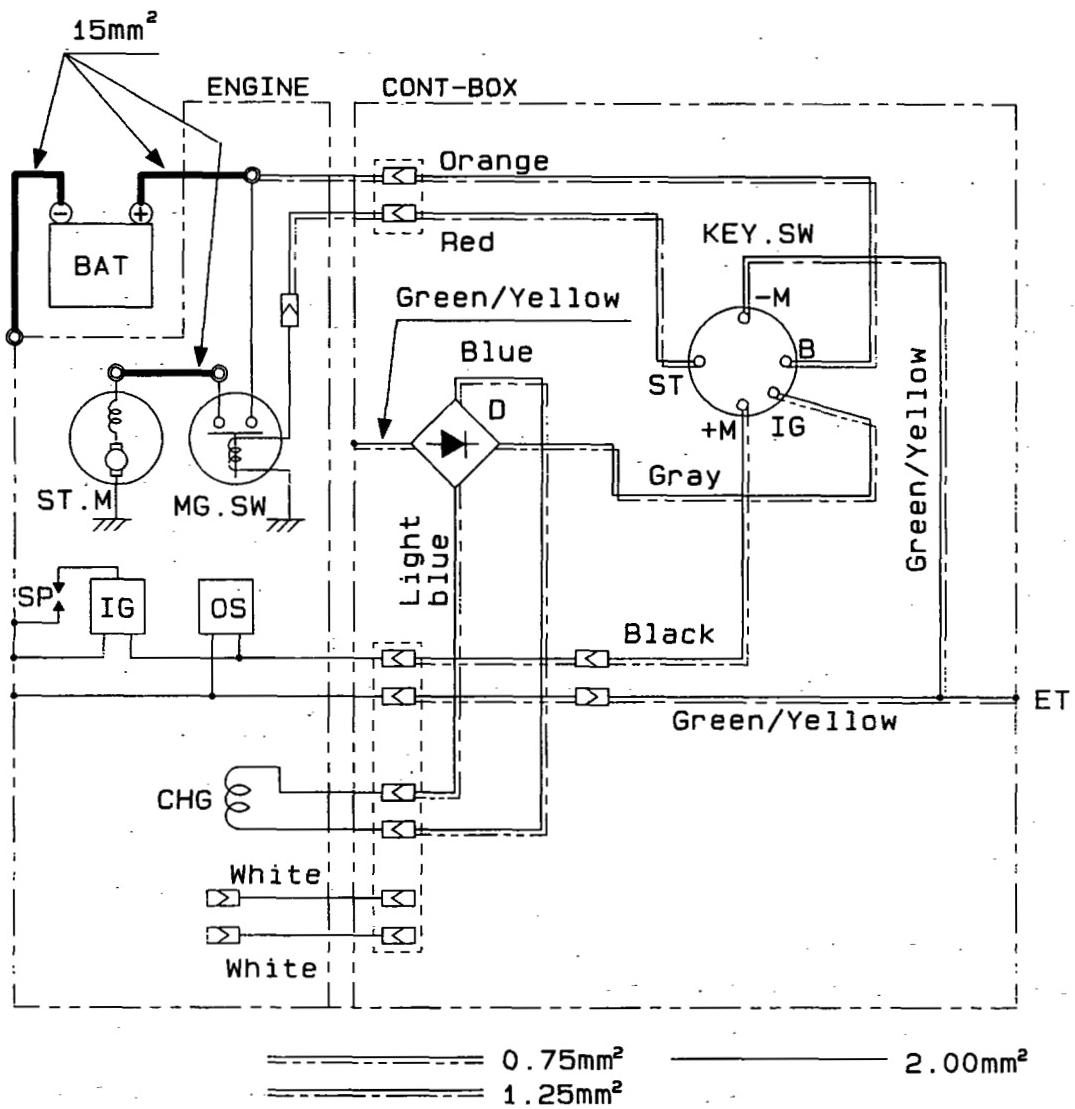
— 0.75mm² — 2.00mm²
— 1.25mm² — 3.50mm²

- RGV6000 : U.S.A., 60Hz-120V/240V [NEMA RECEPTACLE with IDLE CONTROL]



— 0.75mm² — 2.00mm²
— 1.25mm² — 3.50mm²

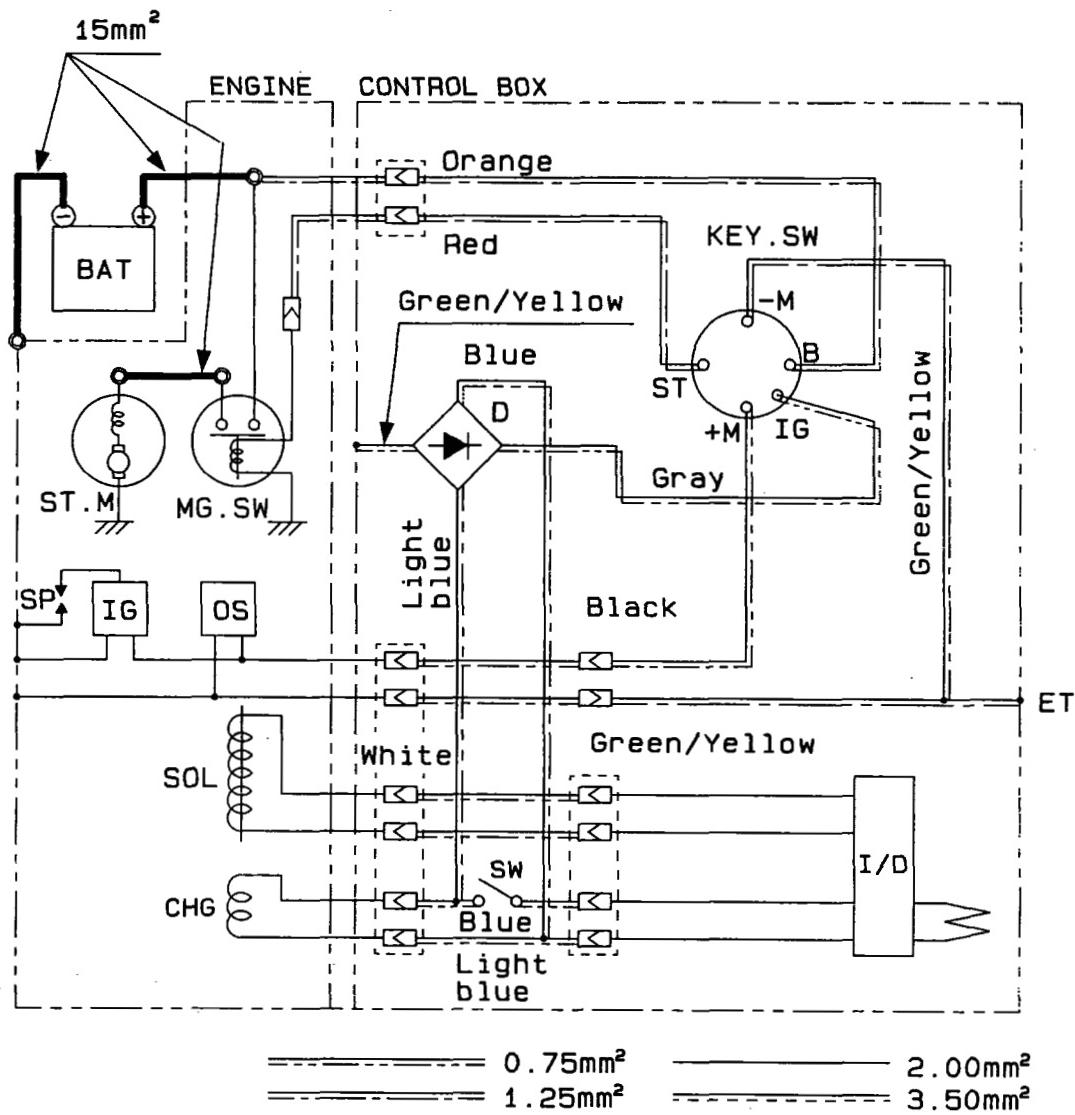
● TYPE WITH ELECTRIC STARTER (Optional Equipment)



Key switch

Terminal Position	+M	-M	B	IG	ST
OFF	○	○			
ON			○	○	
START			○	○	○

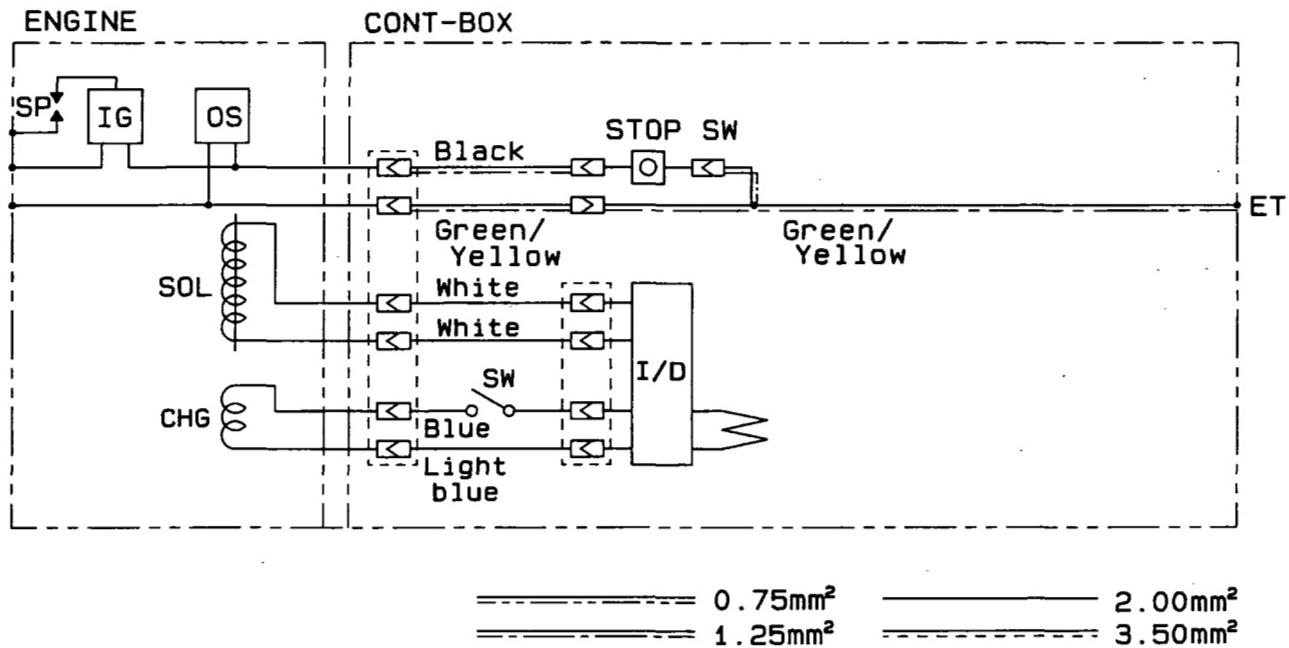
- TYPE WITH ELECTRIC STARTER AND IDLE CONTROL (Optional Equipment)



Key switch

Terminal Position	+M	-M	B	IG	ST
OFF	○	○			
ON			○	○	
START			○	○	○

- TYPE WITH IDLE CONTROL (Optional Equipment)



Symbols	Part Name
MC	AC Winding
CC	Condenser Winding
DC	DC Winding
FC	Field Winding
C	Condenser
D	Diodes Stack Assy
L	Pilot Lamp
T	DC Output Terminal
CB	Circuit Breaker
NFB	No-Fuse Breaker
VC SW	Voltage Changeover Switch
SW1	Voltage Changeover Switch
STOP SW	Engine Stop Switch
O.S	Oil Sensor Control Unit
SOL	Solenoid
I/D	Idle Control Unit
SP	Spark Plug
CHG	Charge Coil
IG	Ignition Coil
MG, SW	Magnetic Switch
ET	Earth Terminal (Ground Terminal)
ST. M	Starting Motor
KEY SW	Key Switch
BAT	Battery
V	Voltmeter
REC	AC Output Receptacle
CONT.BOX	Control Box (Front Panel)

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